



FRIDAY, AUGUST 27.

Kaselowsky's Method of Fastening Tires.

Much attention has lately been paid in Germany to the relative merits of various forms of fastenings for railway tires, and the efficiency of these various fastenings has been the subject of a good deal of experimental inquiry. A fastening which has given exceptionally favorable results in Germany, but which is as yet comparatively little known in this country, is that patented by Mr. E. Kaselowsky, of Berlin. This fastening, which is now being introduced here by Mr. P. Gutke, of No. 44 King William street, E. C., consists of a ring of readily fusible metal (such as zinc) of dovetail section, which is cast into suitable grooves cut into the tire and wheel rim respectively. The sections of ring used are shown by the annexed sections figs. 1, 2 and 3; fig. 1 showing the section employed for engine driving-wheels, fig. 2 that used for other engine wheels, and also for the wheels of tenders and carriages, while fig. 3 is the section employed for light carriage wheels. The grooves for receiving the ring are, of course, turned out of the tire and wheel when these are being

air-tight, with a cement made of clay ground with oil or water. While funnels made of gas piping may be stuck into the openings without further preparation than simply cutting the ends to be inserted into a tapering conical shape, it will be necessary if the other kind of funnel is to be used either to secure it by pressure produced with a spring or screw resting against the base of the wheel, as shown in fig. 8, or to attach it with clamps catching round the two nearest spokes and exerting the required degree of pressure.

Having thus prepared the wheel-frame, the tire, after being heated by the ordinary means, but to somewhat above the customary temperature, is put upon the wheel. The pouring in of the metal should, however, be delayed until the tire is firmly shrunk upon the rim, so as to avoid the possibility of the metal running between tire and rim to any parts other than those actually intended. The comparatively higher heating of the tire before it is driven on to the wheel is desirable in order to enable it to impart some portion of its heat to the rim, whereby the ring-shaped groove destined to receive the fluid metal is duly warmed beforehand.

Great care must be taken to effect this preparatory warming in a sufficient degree, and therefore the process of pouring in the metal should on the other hand not be delayed beyond the exact moment when the shrinking has ceased, for many experiments go to prove that zinc, which is a metal in all other respects particularly suitable for the purpose, ac-

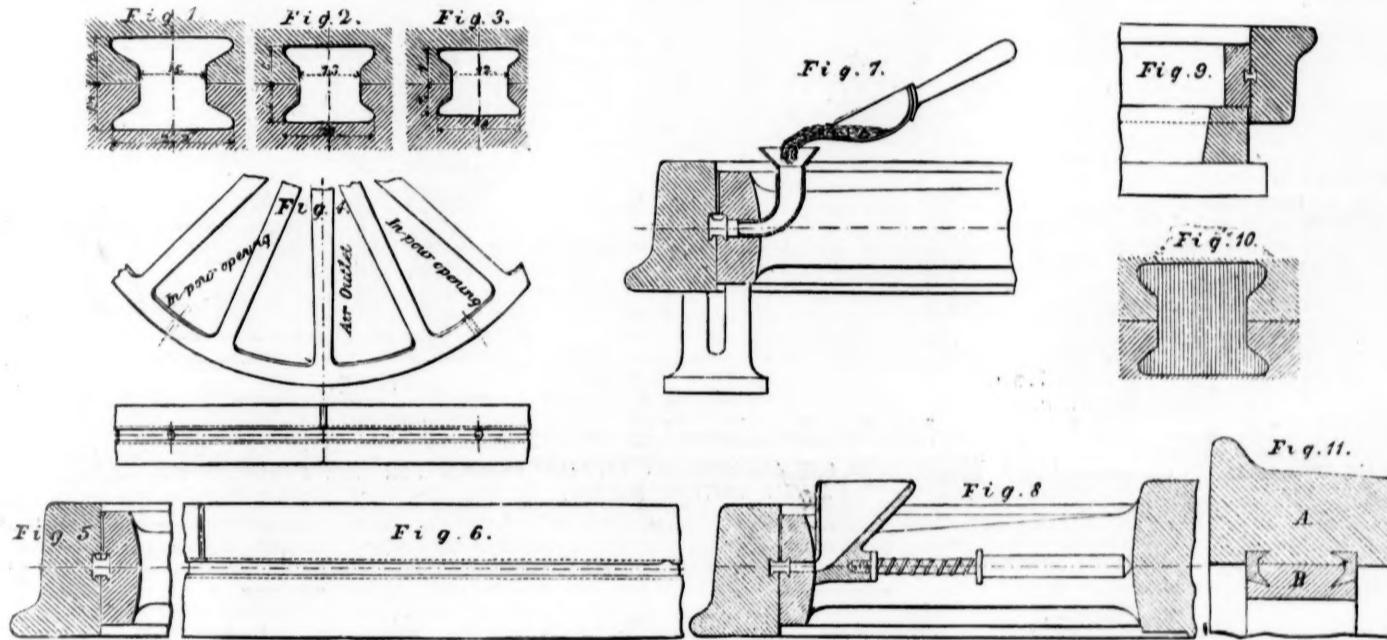
the Panhandle (Little Miami) Company have prepared plans for a large and magnificent depot of their own, purchased the ground, let the contracts, and provided for the completion of the work March 1, 1881, seven months hence.

In addition to the passenger depot, the company have made all the preliminary arrangements for the erection of an immense freight building. The improvements will include the remodeling and grading of the entire territory lying between Pearl and Front streets and Butler and Point Isabella, embracing 10 acres in all, with, when completed, three miles of passenger and freight tracks in the one yard. The total cost of the buildings is estimated at about \$200,000.

The passenger depot will stand on the southeast corner of Pearl and Butler streets, with the main front and entrance on Butler, with a frontage of 90 feet on Pearl by 116 on Butler. It will be two stories high, with main and side towers. It will be built of Zanesville pressed brick, with Buena Vista free-stone trimmings.

The cornices will be of massive single blocks of stone. Galvanized iron will not be used, except where unavoidable, such as for ridges, etc. The cornices will stand 50 feet above the street, and the tower will be 121 feet high. The roofs will be high, and constructed of slate. The whole appearance of the main building suggests strength and solidity. The west facade projects a few feet on Butler street, enough to form a good sized portico, with two wide doors, surmounted by a heavy stone arch reaching over both. The main tower will rise from the corner.

The main floor of the building will be divided into waiting rooms, telegraph, ticket and other offices, and also into dining-rooms, kitchens, etc. The general waiting room will be in the shape of a Greek cross, covering 4,500 square feet of surface. The ceiling of this room will extend to arched trusses, curved columns, etc., and will be 60 feet high.



METHOD OF FASTENING TIRES.

By E. Kaselowsky, Berlin, Germany.

respectively bored and turned. The mode of casting in the ring is as follows:

The openings required for pouring in the metal should be 20 millimetres, or $\frac{1}{2}$ inch, in diameter, and are formed in the rim of the wheel about 3 ft. apart, so that for ordinary railway carriage wheels but three such openings will be necessary; they should, however, be as nearly as possible equidistant. Provision must of course be made for the escape of air. For this purpose it will be sufficient to file or bore narrow channels, as shown in fig. 4, between every two of the openings intended for pouring in the metal. In order also to allow such air as may be contained in the upper portion of the ring to escape without difficulty, the upper lip at the spot where the air outlet is situated should be chipped with a half-rounded chisel, as shown in fig. 5, thus affording the air in the groove a means of egress.

For locomotive driving-wheels it is recommended that the openings or notches just mentioned leading into the dovetail grooves, both of rim and tire, should be placed more closely, so that they may be about 1 ft. apart, the object being to form, in addition to the ring, a kind of toothed arrangement in the connection between tire and wheel. This is intended to guard against the tire revolving round the wheel, even though the former should burst. The notches must be cut accurately true, both in rim and tire, so as to form a perfect rack. If this be neglected, the result would be a damaging longitudinal tear of the ring in event of the tire being fractured.

The wheel and tire having thus been properly prepared the wheel is laid horizontally upon supporting blocks, which being provided with a suitable projection at the same time assist in keeping the edges of the tire at the proper distance in relation to the rim, thus insuring the accurate adjustment of the opposite grooves. The distance-blocks, however, will be required only in the case of tires with lips, such as are now generally used; this lip, of course, fixes the position of the tire relatively to the wheel-rim. In the adjoining sketches fig. 6 shows a plain tire supported on blocks.

Into the in-pour openings may be inserted funnels made of gas piping, as shown in fig. 7, or better still funnels of the shape shown in fig. 8. The latter possess this advantage, namely, that they leave the in-pour openings filled up to the brim with the melted metal; whereas when the former are used a dip or sunken spot remains. The funnels are made

quires, when it is poured into a warm shell or mould, nearly double the hardness which it has when poured into a cold one. Consequently if owing to any untoward circumstance, the right moment for pouring in the metal should have been missed, or if it appear that the warming has been insufficient, in such case it will be absolutely necessary to remedy the evil at this stage by holding the wheel with the shrunken tire to the fire, so as to avoid the so-called chilling of the zinc when it is poured into a cold shell. The like rule must be followed when, owing to local circumstances, the casting of the zinc and the tiring of the wheel cannot be done at one and the same place.

There is also another point to be attended to, viz., that the fluid metal heated as far as practicable just up to melting point and no more should be poured in simultaneously at all the openings, and that the finished wheel should be allowed to cool as slowly as possible in the open air, or better still, under a layer of sand shot over it soon after the metal has been poured in; and further, that under no circumstances should the tire be watered.

Zinc cast in the manner here suggested crystallizes in tolerably fine crystals, and exhibits a conchoidal close fracture, whereas under the careless treatment of an over-cooled mould, or, if poured out either too hot or too cold, the fracture will present a rough, starred appearance, the splitting lines proceeding from the centre toward the sides, and its hardness, as already mentioned, will be materially lessened. As zinc melts at about 720 deg. Fahr., if at any time it should become necessary to strip off the tire, this can readily be done without injury to either tire or rim, by melting it off at an ordinary wheelwrights fire or over an open hearth. Mr. Kaselowsky also states that tires fastened to wheels according to his plan may be put on without the slightest hesitation at just one-half the usual degree of shrinkage, the strain on the tires being thus very materially reduced.

As to the resisting power of Mr. Kaselowsky's ring, evidence is afforded by the results of some experiments made on the Niederschlesisch-Märkische Railway.—*Engineering.*

The New Pittsburgh, Cincinnati & St. Louis Depot in Cincinnati.

While the subject of a Union Passenger Depot for Cincinnati lingers year after year in the brains of its projectors,

Heavy walnut balconies will surround the second story floor of the wings. A 24-burner chandelier, hanging from the centre of the dome, and cluster brackets around the lower floor will light the general waiting room. The main floor will be of black and white marble tile, supported by fifteen I beams and brick arches. On the second floor will be the offices of the Superintendent and others connected with the road. The entire finish of the interior will be of Eastlake design in solid walnut, oil rubbed. Settees of a new design in hard wood will be used in the waiting room. French glass will be used in all the windows—a single pane to each sash. The cost of this building will be about \$65,000.

Directly in rear and extending the entire width of the main building, and running east along Pearl street 385 feet, will be the passenger shed, covering six tracks. It will be built of iron with iron trusses and columns. The Eastern system of fences and gates will be adopted.

The baggage room will be separated from the building and built of brick 25 by 125 feet, divided into rooms for baggage, express and mail.

The freight house will have a frontage of 530 feet on Front street and a depth of 95 feet. It will be built entirely of iron, with corrugated sides, and iron trusses and columns. It will cover two tracks, running the entire length of the building, and will be lighted from the roof. A covered platform for heavy freight, size 60 by 300 feet, will connect the new freight house with that at present in use, which will be remodeled for local freight by re-roofing and the placing of large doors.

The freight offices will be located in a two-story brick annex, in the western end of the freight house.

A brick ice-house is now almost completed on the southwest corner of the ground. It will be 35 feet square, with a capacity of 800 tons.

All the buildings will be of the most substantial character, and as nearly fire proof as they can be built.

The foundations of the passenger depot will be of Indiana flat rock, six feet square and eight feet thick, and three courses in height. About half of the building will rest on six-feet walls.

The entire masonry will be of the best heavy cement work; concrete and piles to be used wherever required. The entire passenger house will have a cellar with concrete floor.

Particular attention has been given to the location and arrangement of offices for the quick dispatch of business, and the entire arrangement of building and yards is said to be the most perfect in the Western country.

A new departure in Cincinnati architecture is the dormer windows of the roof, as also the entire outside face of the building below the window-sills of the main floor, being a heavy 14-foot Dayton stone water table, above which will be three eight-foot courses of Blue Hill limestone, followed by 14 Dayton limestone sill and belt course, on which the press brick begins. All sides, including chimneys, will be faced with

pressed brick, and the building will be massive and substantial, of the best material.

The present approach to the Newport & Cincinnati Bridge will not be changed. The present Eggleston avenue track will be turned by a short radius, and made one of the system of tracks in the passenger yard. The passenger yard and freight yards will be different levels at the west end, joining at the east end, and separated by a stone retaining wall, for the passenger yard.

James Griffith & Sons have the entire contract for the brick part of the passenger depot. The shed and freight buildings have not yet been let. The sub-contractors are Messrs. Ashman & Glasgow, footing stone; Meirers & Co., for stone masonry; Losekamp & Krell, for cut stone; M. Clements, for iron work; William Megrue, the brick work; and Gibson & Co. the plumbing.—*Cincinnati Commercial*.

Details of Express Engine for Great Eastern Railway.

The engravings herewith represent such parts of these engines as it was thought would be of additional interest to our readers in this country.

GLASS WATER-GAUGE AND FIXTURES

The arrangement of these details as represented in the engraving has so much to recommend it, that we reproduce the latter from the *Railway Engineer* with the following description :

"The gauge glass cocks are coupled so as to be capable of being opened and closed together: when open, the handle stands upward at an angle of 45 degrees from the horizontal, so that, should a gauge glass break, the men have only to hit it down with anything handy, instead of groping amidst the scalding steam to shut two cocks by hand."

Locomotive runners, it is thought, will see the advantage of this at a glance.

CROSS HEAD

The engravings of this part of the engines are numbered from fig. 1 to 4. The following description of them and also the engravings are taken from the *Railway Engineer*.

⁴⁴ The engines have single slide bars of cast steel, but as there is no coupling rod to provide for between the cross head and adjacent wheel, the bar can be made wider, and is 6 in. broad by $3\frac{1}{8}$ in. deep, a heavy piece of steel that at first sight seems so much good material wasted, but, like large tools, large slide bars keep cool, and the mass of metal acts usefully in absorbing the heat generated by an undue friction which often arises from purely temporary causes, grit, etc., lodging on the bar; when, if the rubbing surfaces can

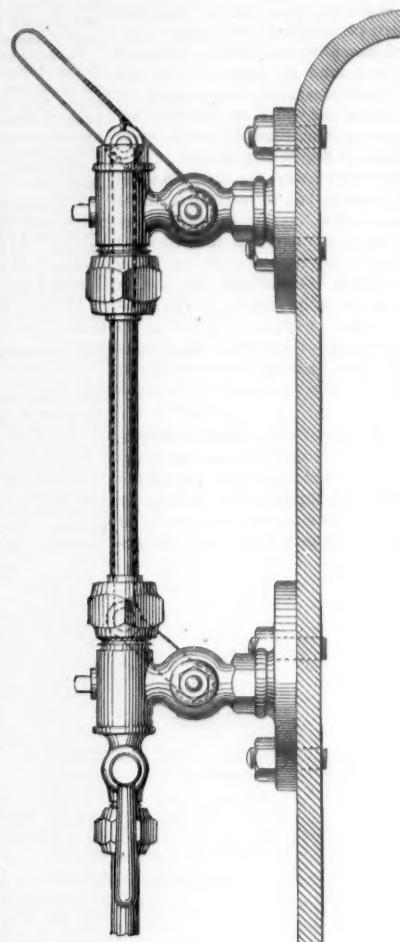


FIG. 7

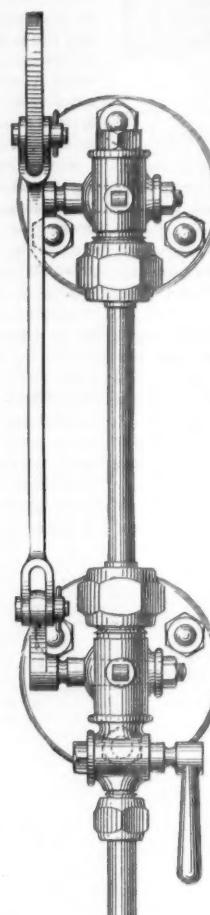


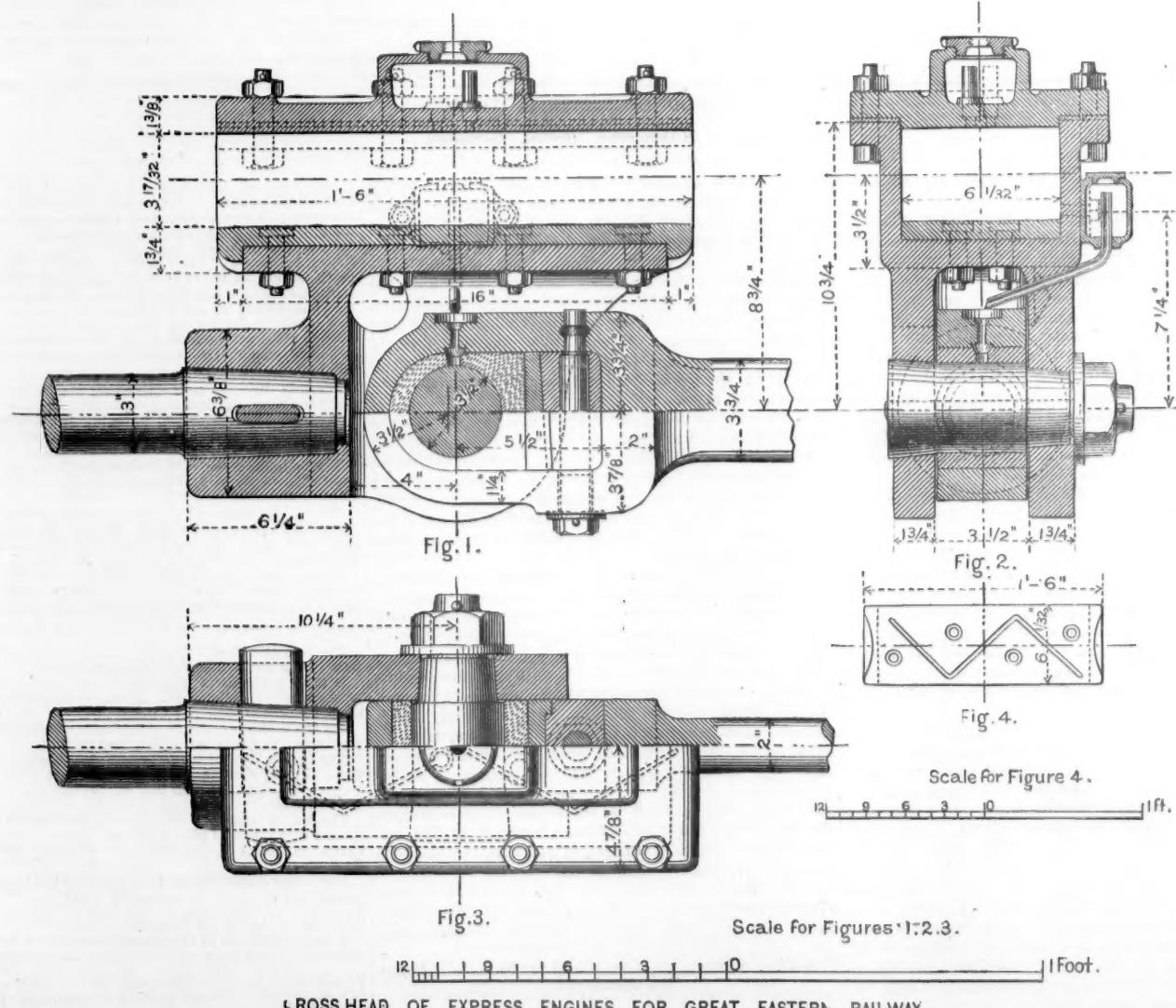
FIG.2

only keep cool while the dirt is being ground into impalpable powder, all will go well. Single slide-bars can be made stiffer and stronger than two or four bars giving the same rubbing area and weighing and costing more, while their simplicity, and the greater facility with which they can be ground, trued up, and put in correct line on the engine are obvious advantages. For outside cylinders they are especially useful, being more out of the way of the leading or bogie wheel nearest the cross-head, and greatly reducing the size of the motion bracket. But, unless carefully protected, they have one great disadvantage. Double slide bars shield one another from dust; any dirt from the men's boots while walking around the engine, or mud thrown up from the ballast below, falls on idle surfaces and does no harm; but, with a single bar, the rubbing surfaces are fully exposed, and their successful use depends in a great measure on their perfect protection from dust and grit. In these engines this is effected by a splasher covering the bogie wheel, and projecting under the slide bars, while a flap hinged to and falling flush with the foot plating is provided above the bars, so that a driver can oil the bars when running. The oil supply being wholly from above, six vertical holes, $\frac{1}{8}$ in. diameter, are drilled through the bar in hit and miss fashion, large shallow counter-sinks, both on top and bottom surfaces of the bar, collecting and distributing the oil. The edges of the bars, and even the margins of the counter-sinks, are carefully rounded off by a file, and the faces are ground dead smooth by an emery wheel held firmly down to its work in a powerful grinding machine. We mention these little details because attention to them ensures success, neglect of them failure. The cross-head, as will be seen from our illustration, embraces the bar, and is provided with cast-iron rubbing pieces, the upper of which carries the slide-bar oil-cup and is bolted to the wrought-iron cross-head, binding the sides together. Wear can be taken up by reducing the thickness of the brass levers between the top rubbing piece and the cross-head; while the slide-bar can be lowered by adding as much to the thickness of the motion plate lines as is taken from that at the cylinder end."

Contributions

Automatic Brake Cocks.

RICHMOND, Va., Aug. 21, 1880.
TO THE EDITOR OF THE RAILROAD GAZETTE.



CROSS HEAD OF EXPRESS ENGINES FOR GREAT EASTERN RAILWAY

a few months ago, when the train was signalled at a flag station. The engineer—a bright, intelligent man, who had been on that run and engine for several years—was astonished to find no result from his "applying the brakes." After an instant's profitless examination he whistled "down brakes," and the train was stopped several hundred yards beyond the station. A search revealed the fact that some object on the track had been thrown up, striking the lever of the cock in the longitudinal pipe under the front end of the forward baggage car, forcing it from its proper vertical downward position to a horizontal position, thus closing the pipe and shutting off the entire train from the engineer's control.

Had a wreck happened, and a "green" engineer been running, all the uncertainty that now exists as to the cause of the West Jersey & Atlantic accident would have been anticipated.

It is not unusual to see safety coupling chains hanging within reach of these levers, so that by a violent swinging motion they would be closed.

The writer has heard of other failures of the automatic brake to act from misplacements of these cocks, due to the lever handles, and thinks wheels would be good substitutes for them.

Track-Bolts.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Will some of your correspondents or some manufacturer give me answers to the following:

Can track-bolts be made perfectly cylindrical without increasing their cost by the necessity of finishing them as the machine bolts are usually finished?

How much conicity should be allowed in track-bolts?

Is it advantageous to make the nuts for track-bolts a tight fit (changing somewhat the pitch of its screw from that of the bolt) if no nut-locks are applied?

INQUIRER.

Elevated Railroad Platforms.

NEWARK, N. J., Aug. 22, 1880.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I desire to call your attention to the principal of construction of the elevated roads that, in my estimation, should be altered at once on all the stations of the roads.

You are well aware that several deaths have occurred from people rushing at the gates of the cars after they have been closed and holding on till they are carried to the end of the platform, where their bodies are brought up against, and squeezed by, the railing at the terminus of the platform; then, by reason of there being no platform extending beyond said railing, their bodies are plunged to the street below, where they themselves are killed, and there is great risk of falling on and killing others that may be passing. Now, sir, there is no reason why the station platform should not extend at least ten feet beyond the end railing, even if it were only made of three-inch slats, which, in fact, would be better than a closed floor.

PREVENTIVE.

[It may be a question whether it would not be seriously against public policy to do anything to save the lives of those who, with malice aforethought, cling to closed car gates until they are dragged off the elevated railroad platforms, and it seems questionable, at least, whether a man who held on until he struck the end railing would not also hold on until, at a faster speed, he was dragged off the proposed 10 ft. extension of the station platform.—EDITOR RAILROAD GAZETTE.]

Automatic Brakes.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Up to this date the papers report 25 deaths resulting from the recent accident at May's Landing, on the West Jersey & Atlantic Railroad, to say nothing of the number of passengers seriously injured. I have read an account of the testimony of the engineer, Aitken, at the coroner's inquest at Camden, N. J., and have seen and been particularly impressed with the editorial comments in your issue of Aug. 20, under the head of "The Accident on the West Jersey & Atlantic Railroad." In that article you evince a thorough acquaintance with both the mechanical construction and mode of applying the "old Westinghouse brake" and the "automatic Westinghouse brake" as well.

The inference drawn from the article in question is, that you have a decided preference for the "automatic Westinghouse brake" over all other power brakes now in use on railroads, although you state that the "automatic [Westinghouse] brake is undoubtedly an intricate piece of mechanism, and it would be impossible almost for any one to understand its construction or operation from a mere external examination without the aid of drawings. This intricacy is without question a great objection to its use, but it is a choice of evils." And further on in your article, you remark: "In the meanwhile, the question is, whether this effective mechanism for stopping trains and protecting human life shall be used, or whether it shall be discarded because it requires the employment of intelligent men, and constant care, watchfulness and expense to keep it in good order."

Now, in the first place, it is a mooted point with railway officials as to the utility of an automatic brake, although the necessity of a power brake on passenger railway trains is generally, if not almost universally, conceded.

In January last at the thirty-third regular annual meeting of the Institution of Mechanical Engineers of Great Britain, held in London, England, the question of "Automatic Action in Railway Brakes" received special attention. A paper was read before the association by Mr. T. Hurry Riches on that occasion in which he states that "As the danger of trains separating has been held to be one of the most pressing rea-

sons for requiring automatic action in railroad brakes," he had carefully searched the Board of Trade returns (in Great Britain) for the year 1878, and had written to a large number of locomotive superintendents in that country, in order to ascertain as far as possible the number of cases where trains have parted, either with or without collision. He found only three cases of the kind reported in the Board of Trade returns for the whole year, and that these constituted the whole number of recorded instances where couplings were broken and where automatic action could display itself: "In one instance, the breaking was caused by automatic action, in another the automatic action was useless, and in the third case it was questionable whether the automatic brake could have been of any more use in preventing the disaster than a non-automatic brake." On the other hand, Mr. Riches states what you accede, "That every automatic brake has at least double the number of parts that a non-automatic brake has; therefore, there is double the risk of failure from parts getting out of order; and, furthermore, many of the working parts of an automatic brake are necessarily complicated and delicate in construction; and hence are more liable in themselves to get out of order." And he sums up his exhaustive report in these words: "That there is not as yet in existence any automatic brake sufficiently reliable to justify its use in preference to the best descriptions of non-automatic brakes."

In repeated experiments in this country alone, the vacuum power-brake now in use on a number of railroads has been proved to be equal in efficiency in every respect to the air brakes of which the "Westinghouse air-brake" is more generally known. Moreover, its first cost and economy in practical operation are much less. The general, and in fact you might say, as between air brakes and vacuum brakes, the only objection to the vacuum brake hitherto has been its liability to burst, or tear its diaphragm or cylinder (composed mainly of india-rubber) during the strain incident to operating it, rendering it, if not unreliable, at least *not entirely reliable and safe*. But that difficulty has been overcome of late by introducing a cast-iron cylinder in place of the old rubber cylinder or diaphragm, and its mechanism has been simplified by introducing double-acting pistons, instead of a single-acting piston, the pressure being thus distributed equally and proportionately on all of the wheels under the bottom of each car at once, and in releasing it almost instantaneously. This latter power-brake has now been in continual use on a number of railroads in the United States and Canada for five years past, and is as sound and effective as when first applied, and seems in all respects to be superior to any other power-brake now in use, especially in simplicity, economy, reliability and durability, and in efficiency equal to any. No particular nor special instruction is requisite to teach the engineer the mode of operating it. Its accuracy can be attested by a superficial glance. No extraordinary repairs are ever necessary, and when in use it does not require the constant supervision of a skilled mechanic to see that its parts are always in working order. It is neither injured by use nor disuse, is always safe and reliable.

Pertinent to the subject under discussion, I would call your attention to an accident on the Harlem Railroad reported in the New York *Herald* of this date: "The locomotive of the Chatham express train on the Harlem Railroad broke loose near Tuckahoe yesterday morning and ran half a mile before it was stopped. The train came to a very sudden halt, as the patent [Westinghouse automatic] brakes were applied by the breaking of the bell rope. No damage was done other than the breaking of the coupling, and the passengers, though much excited, were unharmed." That nothing more serious occurred was owing to fortunate circumstances. Yet it is horrible to contemplate the terrible disaster that might have ensued, had that train been closely followed by another. And the accident was occasioned solely by the automatic brakes in use on that train.

Really, the best safety appliance, or attachment, ever yet introduced upon railroads to prevent disaster by rendering it almost impossible for a train to separate, is the old-fashioned safety hook and link attached to the platform of every passenger car, and if properly coupled, which takes the shortest space of time, will render an automatic attachment to a brake entirely and absolutely unnecessary. The improved vacuum-brake (the one with a cast-iron cylinder and double-acting pistons) is not as extensively known as the Westinghouse air-brake, as it is a more recent invention and is just now being introduced to the public. It has the endorsement of all railway officials who have been and are now using it. The New York, Woodhaven & Rockaway Railroad, just completed, has all of its passenger and express cars fitted up with it, and your valuable paper, which caters so successfully to the railway interests of the country, should in its own interests give this matter a most thorough examination, and let the railway public know through the able columns of the *Railroad Gazette* the result of your observation in the premises.

IRVING W. GREENE.

NO. 56 WILLOW STREET, BROOKLYN, N. Y.,
Aug. 24, 1880.

The New Organization of the Prussian State Railroad Administration.

(Translated for the *Railroad Gazette*.)

[This plan of organization was issued by Minister of Public Works Maybach Feb. 21, and went into effect April 1 of this year.]

§ 1. *Introduction.*—The following regulations shall be in force on all railroads under government management, except where deviations are necessitated by the charter previously granted to a corporation or by concessions granted in the operation.

With regard to private railroads operated by the state on

government or other account, the Minister of the department shall be empowered to permit deviations from the regulations contained in Sections I. and II., according as necessities may demand.

I. GENERAL MANAGEMENT.

§ 2. *Administrative Offices of Railroads.*—The management of the state railroads or railroads controlled by the state, as to construction and operation, shall be in the hands of the following officials, acting under the direction of the Minister of the department:

1. The Royal Railroad Directories.

2. The Royal Operating Bureaux.

3. The Royal Construction Commissions.

§ 3. *The Ministry.*—The Minister shall adjudicate upon the complaints made against the enactments and decisions of the royal railroad directories. The officials shall not be entitled to any appeal where the enactments of the royal railroad directories have been made the subject of complaint.

§ 4. *Powers reserved to the Minister.*—1. *With regard to construction management.*—In addition to the powers of sanction reserved in special cases, the following matters respecting the construction of a railroad must be submitted to the Minister for his approbation:

(a). The sanction of general and special preparatory work and the disposition of plans for the execution of the construction.

(b). The designation of those special projects and propositions of construction which in the approval of preliminary work are reserved for revision by the highest powers and for their final sanction.

(c). The opening to traffic of such finished sections of railroad as are destined for the conveyance of freight and passengers as common carriers.

(d). The approbation of standard rates for the remuneration of the officials connected with the construction of the road, and the granting of remuneration and all subsidies amounting to more than \$75 from the fund set aside for that purpose in the scheme of construction.

(e). With respect to the supply of materials for the superstructure and rolling stock, he shall have the power to close all private contracts for supplies, the value of which exceeds \$12,500, as well as to award such contracts as are open to public tender and where the value of each separate undertaking exceeds \$37,500.

§ 5.—*Respecting the Operating Management.*—In like manner shall be reserved to the Minister with regard to the operating management:

(a). The right to sanction the suspension of operation and to change the operation, by the introduction or suspension of regulations for German railroads of secondary importance.

(b). The fixing and alteration of the time-tables of trains carrying passengers or mails at the commencement of the summer and winter seasons of travel, as well as the approval of the proposed changes during the intermediate seasons, especially in such cases as concern the number and grade of the trains, or in the event of the postal authorities and the railroad officials failing to agree.

(c). The fixing and alteration of the local and line tariffs in all cases where such control does not form part of the duties of the directories.

(d). The approval of projects and propositions for construction and such similar arrangements as have not been taken into consideration at the period of the establishment of the operating department, and those that, though handed over to the respective departments, are reserved for the consideration and final sanction of the higher powers.

(e). The institution of changes in matters that have been settled by the higher authorities, and important alterations in the usual construction of rolling-stock and operating apparatus theretofore customary on the state railroads.

(f). The power of closing private contracts for supplies or labor of a value exceeding \$12,500, as well as the awarding of such contracts as are open to public tender, and where the value of each individual undertaking exceeds \$37,500.

(g). The alteration of all rules and instructions determined by the Minister, the issue of working instructions to such officials as are appointed by the Minister and the deviation from the principles of such working, laid down by the Minister for certain branches of the railroad service.

§ 6.—*The Employees.*—With regard to the personnel of the railroad administration, the right is reserved to the Minister.

(a). To nominate, appoint or remove the chairman and the members of the royal railroad directories, and the chiefs and permanent assistants of the royal railroad operating bureaux and the commissions of construction of the royal railroads; such, for instance, as:

The inspectors of railroad construction.

The inspectors of locomotives.

The inspectors of freight traffic.

The railroad telegraph inspectors.

The masters of railroad construction.

The master mechanics.

The controllers of the chief treasuries.

(b). To change the scale of remuneration of all the above-mentioned officials.

(c). To transfer the officials of one state railroad direction district to that of another, so far as such transfers are not or shall not be specially left to the chairmen or members of the direction of such district.

(d). The granting of remuneration and subsidies from the operating capital in all sums exceeding \$75.

§ 7. *Order of Subordination.*—The directories of the royal railroads are directly subordinate to the Minister. Their title, location and field of operation shall be prescribed by a royal decree.

The royal railroad operating bureaux and the royal

railroad construction commissions shall be subject to the directories of that district in which the section of railroad they are operating or constructing is situated, unless at the period of their appointment other arrangements have been made. Their title and headquarters shall be determined by royal decree.

§ 8. *The Royal Railroad Directories.—General Extent of their Functions.*—The royal railroad directories are charged with the chief control of the administration of all roads in operation or in course of construction within their district. A directory shall be composed of a President as chairman and the necessary number of members.

The royal railroad directories shall decide in all cases of complaint against the orders and decisions of the state railroad operating bureaux and construction commissions. They represent the administration in the direct dispatch of such business as forms part of their duties within their field of operations, so that in their lawsuits, contracts, processes, compromises, etc., they may acquire rights and incur responsibilities for the administration.

§ 9. *Business to be Transacted by the Directory as a Whole.*—The members of the direction shall form a board for the transaction of the following business, as cases may occur in their district, every decision being determined by a majority of votes, with the proviso that in case of an equal division the President is to throw the casting vote: in the event of complaints being made by the officers of the administration against the decision or orders of the officials of the state railroad operating bureaux, the commissions of construction, or the directories, in cases which concern the summary dismissal of any employé not definitely appointed on the regular force, or the infliction of a fine exceeding half a month's pay, or the deferring of the payment of a sum exceeding a month's pay of such employé.

§ 10. *Transaction of Business by Separate Divisions of the Directory.*—In all other business transactions that come within the scope of the operations of the state railroad directories, first the President, or in his place his representative, is empowered to decide. For the transaction of the business of the state railroad directories, divisions or sections shall be formed, whose duties shall be prescribed by the Minister.

The councillors and working assistants of the direction shall be attached to the different divisions according as the President may direct. The distribution of business among the different sections of a directory shall be made by its President according to a system of business to be promulgated by the Minister. Specific duties shall be allotted to the individual members of each section, according to a working plan to be subject to the presidential approbation by the heads of sections, their appointment being reserved for the Minister.

The President of the directory may reserve for his own special labors such matters not requiring the action of the board as he may see fit to select.

Such business as in accordance with the above system is not undertaken directly by the President shall be assumed and undertaken by that section of the directory to which it has been specially assigned by the President.

The chiefs of sections may either undertake personally the transaction of such affairs as may be assigned to their sections, or they may allot them among the members of the section, in accordance with the pre-determined system of business.

The President is responsible for the administration of the district as a whole, the chiefs of sections only for such portions of the work as have been allotted to their respective sections. The President and chiefs of sections are especially liable for the proper, direct and regular division of business, as well as for the nature and provisions of all enactments and decisions in which they may jointly concur. For the rest, on the members of the directory is imposed the individual responsibility for the proper transaction of all such matters of business as may be allotted to them.

The written statements of the directory are made binding by the signature of the President of the board or one of the members. The working assistants of the board of directors can only assume the independent transaction of business where, by order of the Minister, they exercise the functions of a member of the board.

§ 11. *Relation of the Directory to the Operating Bureaux and the Commissions of Construction.*—Where exceptions have not been made in particular cases at the time of their appointment, the operating bureaux of the state railroads, as well as the commissions of construction, shall be absolutely subordinate to the state railroad directory in whose district they belong, and they shall regulate the construction and operation of the lines of railroad they control according to the regulations of the directory.

§ 12. *Special Duties of the Directories.*—1. *With respect to the general administration.*—In addition to the consideration in special cases of the action of the officials of the operating bureaux and the commissioners of construction, as heretofore mentioned, the boards of directors shall be immediately responsible for:

1. The general and impartial regulation of the service within the whole district of the board and for all branches of the administration, and especially for the issue and correction of instruction for all the operating or constructing officials.

2. The auditing, cashier's and accounting departments of the general offices [central administration], and the provision of the money required for construction and operation. Herewith is included the drawing up of the annual report of operation of the directory, and the revision and presentation of the special reports of the operating bureaux, the making up and auditing of the year's accounts of the directory, the as-

signment from the construction fund of the sums necessary for the construction department to the officials of the operating bureaux and construction commissions who are intrusted with construction; the definite calculation of all receipts for transport service with the operating fund as well as all receipts of the construction and other funds of the central management, the calculation of all expenditures of the central management and the direct calculation of all the expenditures of the operating bureaux.

3. The classification of the personnel of all officials of the central administration and of the following officers of the divisional administration:

Those intrusted with the transaction of the business of the railroad operating bureaux and the commissions of construction with their authorized assistants.

All the higher officers of the mechanical and construction departments.

The road and operating auditors.

The supervisors of the cashier's office of the railroad operating departments. With regard to the remaining officials, their definite appointment shall be subject to the approval of the royal railroad directories, which shall also retain the power of transferring them from the district of one operating bureau to another.

The fixing as well as the regulation of the salaries for all those classes of employés where it shall appear desirable, in order to avoid irregularity, shall be within the power of a directory for the whole of its district.

4. All matters respecting the extension of the railroad system, the operation of foreign railroads, as well as the side tracks leading to industrial establishments situated along the line, and the admission of other administrations to run trains on or participate in the operation of their own lines.

5. The transaction of all such business as concerns the directory as a whole, especially the affairs relating to the German Railroad Union, the preparation of yearly reports and statistics, the calculation of the amount of communal income tax payable, as well as the national tax in the case of private railroads.

6. The exercise of all such functions as in private railroads are relegated to the railroad commissions.

§ 13.—2. *Respecting the Construction Administration.*—With reference to the management of the department of construction, the directory shall exercise authority over:

1. The determination, or, when by direction of the Minister this is committed to the operating bureaux or the construction commissions, then the revision and presentation of general and special preparatory works for new sections of railroad, as well as, after these have been determined (§ 4, a), the allotment of the authority to take over and conduct the construction to the proper operating bureau or commission of construction; in like manner the determination or the revision and presentation of all projects and propositions which require the sanction of higher authorities (§ 4 b and 4 c), and the determination of all other projects and propositions that affect:

(a). Standard constructions for the proposed structures.

(b). The laying of tracks.

(c). All structures whose cost exceeds the amount of \$2,500.

2. The appointment of division and section engineers for new lines of railroad in course of construction.

3. The entire provision of road, rolling stock and workshop supplies, as well as the provision of the rolling-stock (locomotives, tenders and cars).

4. All affairs connected with the police supervision of the newly finished lines of railroad, as well as with the opening of the same for traffic.

5. All propositions for the granting of remuneration and pensions according to the directions in § 4, d, as well as the granting of pensions exceeding \$37.50 in amount.

6. In the case of private railroads operated by the state, the final settlement of the construction fund and the provisional reception of the construction accounts.

7. The power to close private contracts for the performance of labor or the furnishing of supplies the value of which exceeds \$12,500, as well as the granting of open contracts, for which public tenders have been received and where each separate undertaking amounts to more than \$37,500, except in such cases where their action would conflict with the regulations expressed in § 4, e.

§ 14.—3. *Respecting the Operating Administration.*—With regard to the operating administration, power of action is reserved in the same manner to the directory in:

1. The determination and alteration of time tables subject to approval by higher authority. (§ 5, b.)

2. Under similar conditions (§ 5, c), the fixing and alteration of tariff rates for freight and passenger traffic.

3. The chief direction of the operating service of all trains passing over the lines under the control of the direction or of an operating bureau, and the authority to decide all cases of complaints and claims for damages against the management arising from the passenger and freight traffic, in so far as:

(a). The complaints concern the arrangement and application of the existing tariff rates.

(b). Where the complaint or claim for damages not only concerns their own line but that of an outside administration, according to the estimation of the directory.

(c). Where a claim made for damages is based on the law empowering arrest of June 7, 1871, and the settlement of the acknowledged damage requires a single payment of over \$750 or an annuity of over \$75.

4. The control of the stock of locomotives and cars, except where particular cars and locomotives have been placed at the disposition of the operating bureaux for the local ser-

vice of the sections of railroad under their special supervision.

5. The direction of the supplies for the general operating and rolling-stock shop, machinery departments and the management of the chief and central workshops.

6. The provision of the road, operating and workshop supplies annually required. (See also § 27.)

7. The provision of the rolling stock (locomotives, cars and tenders).

8. The ratification of all private contracts made on account of the operating fund for supplies exceeding \$1,250 value, and the award of open contracts where public tenders have been made and where the value of each separate contract exceeds \$37.50.

9. The preparation, or where by order of the Minister this is intrusted to an operating bureau, then the revision and presentation of all projects which require, according to § 5, d, the sanction of the higher powers; and also the determination of other projects which concern:

(a). Standard construction for the proposed structure.

(b). Laying of tracks.

(c). New structures which will cost more than \$750 and repairs to other structures which will cost more than \$1,250. The extent of the co-operation of the officials of the operating bureaux in the completion and exposition of the different projects is to be subject to the judgment of the directory.

10. The proposal of grants amounting to more than \$75 for remuneration or pension, as well as the allowance of remuneration or pensions in sums of more than \$75.

§ 15. *Order of Business of the Directory.*—The duties of the royal railroad directories shall be regulated according to instructions to be issued by the Minister. For the adjustment of the business transactions of the directories, the central offices and the chief railroad treasuries are appointed. Their system of business shall be determined by the Minister.

The chief railroad treasury undertakes all the money affairs, as well as the entry and calculation of the receipts and expenditures of the central administration.

The central office transacts all other business of the directory. It consists of a general office and special department offices for the operating management, the traffic management, the construction management and the machinery management. The heads of these offices may, at the same time, be employed as assistants of the directory, and be intrusted with the independent transaction of such business belonging to their department as may be assigned them by the President of the directory, in accordance with the order of business.

§ 16. *The Operating Bureaux of the royal railroads.—Functions of the Bureaux.*—The operating bureaux of the royal railroads shall attend to the transaction of all current business that concerns the railroad when in construction and operation, except in such cases as authority is reserved for the action of the directories (§ 12 to § 14), or the Minister (§ 4 to § 6).

Within their respective districts, they represent independently in such matters as concern their office, the administration to which they belong, so that without special orders, through their legal proceedings, agreements, processes and contracts, they may secure legal rights to the administration or incur legal responsibilities for it. They also control the railroad police administration in their district.

The business intrusted to the railroad operating bureaux is transacted by them on their own responsibility. Their decisions only require the sanction of higher authorities in the event of their deviating from the general regulations, or where in special cases the necessity for the sanction of the higher powers is expressly stipulated for. In addition, the operating officials shall execute all tasks intrusted to them by the railroad directory, whose instructions they shall closely follow in every instance.

§ 17. *Appointment of the Operating Bureaux.*—The railroad operating bureaux shall be provided with an Operating Director as President and with the requisite number of permanent working assistants, of whom one shall be commissioned by the Minister permanently to represent the Operating Director.

§ 18. *Order of Business for the Operating Bureaux.*—The business affairs of the railroad operating bureaux shall be transacted by the Operating Director or by the permanent working assistant he has commissioned to undertake them.

The Operating Director is responsible for the systematic conduct of business and the operation in general; he is especially responsible for the regular and proper apportionment of the work, as well as for the nature and contents of all such decisions and statements of the operating bureau as may require his endorsement. The permanent working assistants of the operating department are responsible for the proper transaction of all business affairs that may be assigned them for fulfillment.

The signature of the Operating Director or one of the permanent working assistants shall suffice to render binding any written statement by the officials of the operating bureau.

The order of business of the railroad operating bureau shall be determined by the Minister.

§ 19. *Cashier's Office and Operating Office of the Operating Bureau.*—The cashier's office and the operating office of the operating department are designated as the places for the conduct of the business of the railroad operating bureaux.

The cashier's office of the operating bureau attends to all the monetary transactions, as well as the accounting of the receipts and expenditures of the department.

The business system of the above offices shall be determined by the Minister.

Where there is no cashier's office attached to the operating department, the business that would be transacted thereby shall, according to detailed orders from the Minister, be undertaken by the general treasury department or by station cashiers of the railroad directory to which that bureau belongs.

§ 20. *Inspectors of Transportation and Traffic.*—The inspectors of transportation shall inspect and oversee the train and station service; the traffic inspectors, the freight dispatching and financial service within the district of the railroad operating bureau to which they are assigned.

The duties and positions of transportation and traffic inspectors may, in case of necessity, be united in one official.

§ 21. *The Royal Railroad Construction Commissions.*—The commissions of railroad construction shall undertake the direction of such construction works as may be intrusted to them, as well as the transaction of all business relating to the constructive management in the district to which they are assigned, so far as they are not already provided for in the directions contained in § 4 to § 6 and § 12 to § 14 of the organization, or reserved in the prescribed order of business for the final decision of the Minister or the directory set over them. The appointment of the commission of construction, as well as the determination of their order of business, shall, in every case, be vested absolutely in the Minister.

II. SPECIAL BRANCHES OF ADMINISTRATION.

§ 22.—1. *Maintenance and Inspection of Road.*—The maintenance and inspection of such lines of the railroad as are in operation includes the charge of keeping the track in a good state of repair, together with all structures that may belong thereto, as well as the proper guarding of the road. Where these duties are not allotted to the operating bureaux, railroad engineers [“masters of railroad construction”] or inspectors of construction, shall be appointed, who shall, at the same time, exercise control over the road police within their respective districts.

Subject to these shall be the road-masters and the switchmen, track-watchmen, assistant watchmen and section-men subordinate to them.

§ 23.—2. *Station and Train Service.*—In the station and train service there shall be subject to the railroad operating bureau the station masters, the station inspectors, station assistants, telegraphers, porters and night watchmen, yardmen and switchmen, as well as the employés assigned to duty on the trains—the conductors, baggage masters, guards, brakemen and oilers, together with the appropriate staff of assistants and laborers.

§ 24.—3. *The Locomotive Service.*—The locomotive service includes provision for the sufficiency and available readiness of the motive power, the maintenance in working order of the locomotives and cars both while in service and while not running, and the regulation and supervision of the men employed in the locomotive service. When these duties cannot be undertaken by the railroad operating bureaux, inspectors of locomotive service or master mechanics are to be appointed.

To them shall be subject the employés to whom the locomotive (train) service is directly intrusted, the engine-men and firemen and the car masters, with their respective staff of laborers at the different depots.

§ 25.—4. *Shipping Service.*—To insure a proper despatching service, the employés intrusted with the ticket, baggage and freight service, as well as the warehouse superintendents and loading superintendents, with their respective assistants, shall be subject to the railroad operating bureaux at all depots within their district.

The control of the whole service at the station is intrusted to the station master, and his authority is also extended beyond these limits to the despatching service.

§ 26.—5. *Chief Workshop Service.*—The workshop service in the chief workshops of the railroad shall be under the authority of special (workshop) inspectors of machinery and master mechanics, to whom shall be subject the necessary staff of foremen, overseers, porters, night watchmen, engine-men and the requisite number of laborers appointed for each workshop.

§ 27.—6. *Administration of the Supply Department.*—The total annual provision and the control of the supplies for operation, superstructure, workshops and uniforms is undertaken by the directory and its agents. To what extent the co-operation of the operating bureaux is required will be set forth in the service instructions issued by each individual administration. The larger store-houses are intrusted to special functionaries, *i. e.*, store-keepers, while the stores that are kept in stock at the smaller depots at the stations and minor shops and along the line shall be placed under the supervision of the road-masters, station-masters and shop foremen.

§ 28.—7. *Telegraph Maintenance Service.*—For the telegraph maintenance service there shall be appointed in the territory of each directory one or more inspectors of telegraph, who will be responsible for the arrangement and supervision of the lines and apparatus, according to the instructions issued by the directory and the railroad operating bureau concerned. The telegraph overseers intrusted with the maintenance of the lines and apparatus, as well as the operators and station men intrusted with serving the apparatus, are, as regards the technical manipulation of their instruments and the necessary materials, subject to the telegraph inspector; in other respects to the operating bureau.

§ 29.—8. *Administration of Construction Department.*—The chief direction of the construction of new lines of railroad is undertaken, according to circumstances, either immediately by the royal railroad directories, by special commissions of construction, or by those operating bureaux within whose territory the new line will be placed. Under the officials controlling the construction shall be appointed, in

the event of the construction of new lines of considerable extent, division engineers, to whom are subject the whole overseeing and laboring force. The services of employés employed by the operating department, such as assessors, architects, foremen of construction, draughtsmen, etc., shall in case of necessity be available to the construction department.

§ 30. *Administration of the Cashier's Department.*—For the management of the financial business there shall be, in addition to the chief railroad treasury and the offices of the cashiers of the department of operation—where the latter have been established—station and agency offices for the operating department, and a special construction treasury for the department of construction.

Through the special construction treasury all payments required by the construction department shall be made, and the business of these offices may be intrusted to experienced, properly-fitted and responsible persons, according to the regulations issued for this purpose.

The agency cashier's offices (for tickets, baggage and freight) are appointed to receive the earnings of the road from traffic, and are to be managed either by the agent personally or by a cashier designated to serve with him. They must hand in their receipts periodically to the station cashiers, except where for practical purposes it is desirable to forward them direct to the central railroad cashier's office or the office of the cashier of the operating department.

The station cashiers shall undertake, in addition to the collection of all such moneys as may not be actually received from the transportation business, the making of authorized payments from the balance in the office and the periodical transfer of the balances and vouchers to the office of the cashier of the railroad operating department or chief treasury under whose authority they may be placed. The station cashier's offices shall be in charge of special cashiers or receivers, or, in case of small depots, they shall be under the charge of the station official who may be thereto appointed. The manager of the station cashier's office can also, in case of necessity, be given charge of the agency cashier's office. Where a railroad operating bureau is located, the station cashier's duties may be incorporated with the office of the cashier of the railroad operating department.

On the state railroads, working expenses which the operating bureaux designate for payment shall be settled independently by the operating treasury. The summary statements of expenditures to be entered quarterly in the books of the chief treasury department, shall, in the annual balancing of accounts by the directory, be accompanied by the special accounts to be submitted by the operating bureaux. Where the chief management of the construction of new lines of railroad is undertaken independently by the railroad operating bureaux, the operating department treasury keeps the books and accounts for the construction funds in question.

III. GENERAL REGULATIONS RESPECTING APPOINTMENTS IN THE STATE RAILROAD SERVICE.

§ 31. *Method of Appointment.*—The appointment of regular employés in the state railroad service shall occur either through their presentation to a regular position, or by a service contract proportioning the rate of daily earnings.

Track-guards, switchmen, porters and platform hands, night watchmen, treasury and office servants, ticket-printers, store-keepers, bridge-tenders, engine and hoisting-crane attendants, hoist-masters, coal-measurers, sailors and ferry-overseers, oilers, brakemen and firemen are appointed by service contract proportioning the rate of daily earnings. Appointment to a regular position on the staff shall be either permanent (for life), or terminable on notification.

Appointments terminable on notification can only be made at the expiration of a prescribed period of probation, which, except in cases where it has been fixed by special regulations, shall as a rule amount to one year.

The permanent appointments of subordinates and under officials (§ 33) can only be made in case of such state railroad officials as have occupied their official position and fulfilled its duties satisfactorily for five years.

The appointment by service contract proportioning the rate of daily earnings can only occur at the expiration of a period of probation, which shall, as a rule, last six months.

In all other respects, the appointment and promotion of officials to positions in the state railroad service shall be according to qualification and seniority.

§ 32.—2. *Requirements of Appointees.*—(a) *For the Higher Officials.*—To be appointed as President or member of a royal railroad direction, as Superintendent or permanent working assistant of a railroad operating bureau, as inspector of construction or inspector of locomotives, as master of railroad construction, or as master of machinery, the necessary government high-class examination must, as a rule, be passed. The determination of other requirements and conditions on which the appointment to one of the above-men- tion positions depends will be effected by special regulations.

Such persons may also, in exceptional cases, be appointed as working assistants of a royal railroad operating bureau, as by reason of years of previous service as working assistants of a royal railroad direction or a royal railroad operating bureau have, according to the judgment of the Minister, proved their fitness for the occupation of such position.

§ 33. *For the Other Officials.*—*Age.*—Such persons as are to be appointed to official positions in the government railroad administration shall be under forty years of age at the period of entering the state railroad service. Exceptions can be sanctioned only by the Minister.

§ 34. *Right to Certain Appointments.*—For the filling of such positions as are chiefly or exclusively reserved for discharged soldiers, the appointment shall be regulated by

the laws governing the employment of such military and naval candidates.

For the filling of such subaltern positions as, according to the regulations, may be occupied by civilian candidates, the rules governing the engagement of civilian supernumeraries generally, and those relating to the state railroad service specially, shall be applicable.

In cases where on the filling of such vacant positions as are reserved exclusively for discharged soldiers, it has been regularly determined that properly qualified soldier candidates are not available, as well as in the case of such positions as are neither exclusively nor alternately destined to be filled by military candidates, such for instance as the positions of technical railroad secretary, foreman, overseer, locomotive engineer, locomotive and stationary engine fireman, road-master, draughtsman, car-master, etc., other applicants may be appointed to fill these positions.

§ 35. *Qualifications of Particular Classes of Officials.*—The requirements governing the employment and appointment of the railroad police officials and the engine-men shall be determined by the regulations issued, or to be issued, by the Council of the Confederation respecting the ability of these officials, and according to regular instructions on this subject to be issued by the Minister with these regulations.

On assuming a position which includes the charge of a store-house or cashier's department, the necessary official security must be deposited according to the proper legal requirements and regulations.

§ 36. *Examinations.*—In order to demonstrate their possession of the knowledge and capability necessary to transact the business attached to any particular post, the regular examination must be passed by the candidates as directed. Any exceptional deviation from this rule must be sanctioned by the Minister.

§ 37.—3. *Income and Emoluments.*—The regulation of the official income and the official emoluments of officers (including salary, increased wages necessitated by increased cost of living, commissions added, living and traveling expenses when traveling on duty, expenses of moving, official residence, pensions, etc.), shall be determined by the laws and regulations issued for this purpose.

§ 38.—4. *Uniform.*—All officials who are required to wear a uniform shall wear the regulation uniform whenever on duty.

§ 39.—5. *Discipline.*—The service position of all employés whose appointments expire on notification is expressed in the special conditions of their appointment, or in their engagement contract, as well as in the established laws and regulations concerning them.

§ 40. *Final Regulation.*—Those railroad directories for whose districts no operating bureaux have been established as yet must undertake such business duties as would be allotted to the officials of such bureaux by the preceding regulations in all cases, save only where the Minister, deviating from this rule, shall make exceptions.

RAILROAD LAW.

Rights of Material, Men and Employés of Railroads as against Mortgages.

At the meeting of the American Bar Association, in Philadelphia last week, George Tucker Bispham, of Philadelphia, read a paper on the “Rights of Material, Men and Employés of Railroads as against Mortgages.” When it was considered, he said, that over 10,000 miles of railroads were now being operated under receivers appointed by courts, the magnitude of this subject could be estimated and the attention it had attracted in legal literature could be understood. Much discussion had taken place during the past 15 years before and by courts. In some cases courts had gone very far in interfering with rights of bondholders. Courts had put the priority which had been allowed to wages and supply claims on three grounds—public policy, which required courts to protect the claims of those whose labor or material went to maintain works of great public convenience, such as railroads; the general principle of equity that he who sought equity should do equity; and because in some cases income which would otherwise have been used to pay current expenses for supplies and labor had been used to furnish permanent improvements to the road; and it was, in such cases, just that funds which had been diverted from labor and supply claimants should be restored to them out of the net income in the hands of the receiver. These grounds of the decision of the courts were examined, as they were applicable to three classes of property, *viz.*: The corpus of mortgaged property, the income, and the personality acquired after the creation of the mortgage, but supposed to be embraced in its terms. To all of these classes of property the conclusions reached were that, neither on the ground of public policy nor of general equity, were wages and supply claimants entitled to priority, and that even the test of diversion and restoration, as laid down by the Supreme Court of the United States in *Fosdick against Sci a*, reported 9 Otto, was to be very cautiously applied, and should not be extended. This case was commented on, and reference was also particularly made to the recent order of the Circuit Court of the United States in the Philadelphia & Reading Railroad case and the decision of the Supreme Court of Vermont in the recent case of *Poland against the Lamotte Valley Railroad Company*.

Contract to Limit the Number of Depots Void.

The following is the head note of a decision of the Iowa Supreme Court in the case of *Williamson vs. Chicago, Rock Island & Pacific Railroad Company*:

A railroad company, in consideration of the conveyance to it of certain lots by the city agreed to build all its depots, both freight and passenger, in a specified locality in the city in East Des Moines, and stated that it would build depots in no other portion of such city. It afterwards began to build depot buildings in another part of the city, in West Des Moines. In a suit brought by the city for damages by reason of violation of the contract, *Held*, that the contract was against public policy and void, and no action for its breach could be maintained.

—Mr. Walter S. Ringgold, formerly for many years Secretary of the Chesapeake & Ohio Canal Company, died at his residence at Jessup's Cut, Md., Aug. 21. He was formerly a well-known resident of Washington.



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CONTENTS.

ILLUSTRATIONS:	Page.
Method of Fastening Tires.	451
Glass Water Gauge for Express Engines.	451
Great Eastern Railway.	452
Crosshead for Express Engines.	452
Great Eastern Railway.	452
Automatic Brake Cocks.	452
Track Bolts.	453
Elevated Railroad Platforms.	453
Automatic Brakes.	453
EDITORIALS:	
Continuous Brakes.	450
Growth of Passenger Traffic.	450
German Railroad Administration.	457
The New Chicago Apparition.	458
Belgian Railroads in 1878.	458
Record of New Railroad Construction.	458
EDITORIAL NOTES.	458
NEW PUBLICATIONS.	458
GENERAL RAILROAD NEWS:	
Meetings and Announcements.	460

CONTRIBUTIONS:	Page.
ANNUAL REPORTS:	
Oregon Railway & Navigation Co.	404
MISCELLANEOUS:	
Kaselowsky's Method of Fastening Tires.	451
The New Pittsburgh, Cincinnati & St. Louis Depot in Cincinnati.	451
Details of Express Engine.	450
Great Eastern Railway.	452
The New Organization of the Prussian State Railroad Administration.	453
A Modern Lake Freight Steamer.	459
Work at the Paterson Locomotive Shops.	459
Prize for Improved Cattle Cars.	459
Examinations for Color-Blindness in Connecticut.	459

EDITORIAL ANNOUNCEMENTS.

Passes.—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

Addresses.—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed to EDITOR RAILROAD GAZETTE.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns our own opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

CONTINUOUS BRAKES.

A few years ago there was no question relating to the operation of railroads which was so vehemently discussed in this country as the merits of different kinds of train brakes. Railroad men were divided into parties, one the advocate of brakes operated by compressed air and the other of those of the vacuum plan. This contest, however, suddenly ceased by the purchase of the patents of the vacuum brake by the Westinghouse Company, after which there was no one specially interested in continuing the contest. In England, however, the case has been different. There the patents for the Smith vacuum brake remained in the possession of their original owners, and besides this one a number of other plans of brakes were introduced. The discussion has been continued there, and has increased in earnestness, and it might almost be said in violence, and is still going on. Hardly a month passes without some contribution to the literature of the subject, either in the form of a paper before one of the engineering societies, or a report concerning the operation or construction of one or more of the plans which have been proposed. This discussion and the competition which is going on there will have the effect of

determining the relative merits of the different plans for brakes which have been proposed and tried, but it also has the effect, and of this there is much complaint in England, of delaying the general introduction of continuous brakes. Here, we believe, no road which has, or expects to have, any through connections with other lines has for several years equipped its rolling-stock with anything else excepting the Westinghouse automatic brake, for the reason that the rolling-stock of other lines is now more generally provided with this form of brake than with any other; consequently through lines are generally adopting it, in some cases, perhaps, chiefly for the sake of conformity with other lines. The advantages of uniformity in rolling stock are undoubtedly very great, but it has often been pointed out that its attainment, if made a paramount object, may lead to the general adoption of imperfect appliances, and that the fact of their being thus established in general use may result in their being retained long after better devices have become known. It is certain, at any rate, that inventions, like most other things, are very much improved if they are subjected to severe competition and their working is constantly scrutinized. The condition of things here in relation to the brake question is for these reasons not an entirely healthy one. The through lines are generally adopting the Westinghouse automatic form of brake, and the only places where other plans can be introduced are on lines which have little or no interchangeable traffic with other roads. There is therefore but little incentive to inventors to show the superiority of their plans, and of late years competitive trials of brakes have been almost unknown in this country. In Great Britain the case is very different. There the Board of Trade, which has supervision over such matters, has been urging the different lines to adopt some form of continuous brake which will fulfill the following conditions:

- "1. The brakes to be efficient in stopping trains; instantaneous in their action; and capable of being applied without difficulty by engine-driver or guards.
- "2. In case of accident, to be instantaneously self-acting.
- "3. The brakes to be put on and taken off (with facility) on the engine and every vehicle of a train.
- "4. The brakes to be regularly used in daily working.
- "5. The materials employed to be of a durable character, so as to be easily maintained and kept in order."

The fact that a complete and satisfactory fulfillment of these conditions, by any system of continuous brakes, would, in all probability, lead to its general adoption in Great Britain has stimulated, not only the two inventors who contested for a similar prize in this country a few years ago, but, as stated, it has attracted a number of others, and now about a half-dozen different forms of brake are urged upon the attention of the British public, and especially to the notice of the Board of Trade. Experiments of various kinds are constantly being made, papers are written setting forth the advantages of each, and elaborate arguments are published showing the facts and the reasons for and against each system. The consequence is that the defects in each are exposed, and the inventors are stimulated to the utmost to remedy them and to devise improvements. The law of the survival of the fittest is being applied to brakes there with unrelenting strictness, and whatever is dark or obscure is quite certain to be illuminated by publicity and criticism as by an electric light. While we may congratulate ourselves in the progress toward uniformity in continuous brakes which we are making, it would at the same time not be wise to shut our eyes to what is going on elsewhere, and it is desirable that the discussion of the subject should be continued here.

It is, therefore, gratifying that the reference to the efficiency of the automatic brake, in the comments in our last week's issue on the accident on the West Jersey & Atlantic Railroad, has had the effect of calling out several correspondents, who are disposed to question the efficiency, or at least the reliability, of automatic brakes. It would also be very desirable, as indicated above, if competitive trials could be renewed here so as to give railroad men more definite knowledge of the performance of brakes of the different systems.

A correspondent whose letter is published on another page in discussing this subject tries to lead us into some admissions and inferences which we decline to be led into.

He says, "the utility of an automatic brake is a mooted point with railway officials." This is to some extent true, especially in England, where, as stated, the subject is now being discussed with much earnestness and some bitterness. There is, however, no difference of opinion among railroad managers or engineers about the importance of applying brakes quickly when the emergency for using them arises. This is of

special importance in long and heavy trains which run at a high rate of speed. Our readers will probably not be at a loss to determine whether a brake which keeps a supply of compressed air under each car can be applied more quickly than one which must either force or exhaust all the air required to operate the mechanism to or from each car in the train before the brakes can be put on. The fact that the Westinghouse automatic brake carries the compressed air, or the power to operate the brakes, under each car, so that it can be released almost instantly, makes it more prompt in its action than any other brake of which we have any knowledge. Its superiority in this respect is greatest when applied to long trains. The difference in the time in which it and the different forms of non-automatic brakes can be applied is lessened as the train is shortened.

Our correspondent also says that we "concede" certain things which Mr. Riches says in a paper read before the Institution of Mechanical Engineers. A simple denial of the concession is perhaps all that is now required.

In the accident on the Harlem Railroad, which is quoted, it is true that if a train "had been closely followed by another," a terrible disaster might have occurred, yet we don't see that the danger of the accident would have been lessened if the train had been stopped slowly instead of quickly, if it was not in sight from the track behind it. With a given interval of space between trains, a quick stop would give more time to send out a flag and stop the following train than a slow stop would, because while the first one is gradually slowing up the following one would be gaining on it. At any rate, a train should not follow another so closely that there is no time to flag the last one in case of accident to the first, a fact which no doubt the managers of the Harlem Railroad have taken into account in making their regulations. The accident quoted is, in reality, an illustration of the value of automatic action in a train-brake, because it is "horrible to contemplate the terrible disaster that might have ensued" if the train had not been stopped by the brakes and had run into the engine in front of it.

It is not our purpose to undervalue vacuum brakes; what we do say though is that a long train of cars running at a high rate of speed cannot be stopped as quickly with any vacuum brake which has come under our observation as it can be with the Westinghouse automatic brake. For short trains, however, the former are very efficient, and their simplicity is very much in their favor. It would of course be folly to say that the Westinghouse automatic is the most efficient form of brake which can or will be devised. All that is said is that it will stop a train quicker than any train-brake that we know anything about. If it could be simplified it would no doubt be a great gain. There are indications that this may result from the severe competition and criticism to which it is now subjected in England. The last copy of *Engineering* which has been received contains a report of a trial of four different kinds of brakes, the Eames, the Sanders, the Westinghouse and the Fay. The report is by Captain Douglas Galton, and, although only a portion of it has appeared thus far, it is evidently intended to determine with more or less definiteness certain questions which have heretofore been in dispute, and it will be worthy of the attention of railroad officers who are concerned about the question of brakes, and we will therefore probably refer to it again.

It is to be regretted that the correspondent, whose letter we publish, has not given the name of the brake which he commands so highly.

THE GROWTH OF PASSENGER TRAFFIC.

We have often called attention to the fact that while in the dullest of times there has been a continuous and generally a rapid growth of freight traffic on most American railroads, passenger traffic on many important lines, and we believe we may say generally except in the West where there was a decided growth in population, has been substantially stationary for many years—on such roads as the New York Central, the Michigan Central, etc., after the financial panic of 1873 generally falling off somewhat, so that the passenger business of 1878 was in many cases the lightest for many years. This is true of the Erie, the New York Central, the Boston & Albany and many other roads. A general view of the course of this traffic for a series of years may be had below, in which the figures under the years indicate millions of passenger miles:

	1882	1873	1874	1875	1876	1877	1878	1879
Bos. & Albany	113	121	122	120	111	103	101	101
Eastern	66%	76	86	75	69%	68%	62	65
Boston & Prov.	36%	41	39	39	38	36	37%	38
N. Y. N. H. & Hartford	125	123	124	123	124	112	105%	103
N. Y. C. & H. R.	319	339	351	339	353	317	300	291

	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.
Erie.....	156	165	160	155	163	171	140	149
Rensselaer & Saratoga.....	17	21	21	21	19	19	19	19
Rome, W. & O.....	12 $\frac{1}{2}$	14 $\frac{1}{2}$	14	14	15 $\frac{1}{2}$	17 $\frac{1}{2}$	15	20 $\frac{1}{2}$
Central of N. J.....	49	48 $\frac{1}{2}$	51	50	60	56	56	56
United N. J.....	162	167 $\frac{1}{2}$	163 $\frac{1}{2}$	162	143	139	147	147
Northern Cen.....	29	29	30	43	28	24	26	26
Pennsylvania.....	174	177 $\frac{1}{2}$	175	100 $\frac{1}{2}$	288	143	142	156
Phila. & R.	74	80	79	76 $\frac{1}{2}$	124	74	75	99
Phil. & W. & B.	61 $\frac{1}{2}$	64	68	66	105	50	60 $\frac{1}{2}$	62
At. Miss. & O.	13	12 $\frac{1}{2}$	11	11	10 $\frac{1}{2}$	9 $\frac{1}{2}$	9 $\frac{1}{2}$	8
At. & G. W.	42	38	39 $\frac{1}{2}$	37	36 $\frac{1}{2}$	33 $\frac{1}{2}$	37	41
Cleve., Col., Cin. & Ind.	27 $\frac{1}{2}$	27 $\frac{1}{2}$	29	30 $\frac{1}{2}$	36	29	29 $\frac{1}{2}$	34
Cleve. & Pitts.	19 $\frac{1}{2}$	21 $\frac{1}{2}$	19	17 $\frac{1}{2}$	20	15 $\frac{1}{2}$	15	16 $\frac{1}{2}$
Lake Shore & Mich. So.	162	179	173	165	175 $\frac{1}{2}$	138	134	141
Pitts., C. & St. L.	26	28	29	42	29	29	31 $\frac{1}{2}$	31
Pitts. Ft. W. & Chicago.....	92	92	84	108	76 $\frac{1}{2}$	78	86	86
Mich. Central. ....	.....	.....	87	94	80	93	.....	.....
Col., Chic. & Ind. Cen.....	35	35	33	38	32	32	34	34
Ind. & St. L.	14	.....	13 $\frac{1}{2}$	12	11	8	11	12
Chic. & Alton. ....	.....	.....	40	41	41	38	54	54
Chic. Bur. & Quincy.....	83	85	94	99	93	.....	119	.....
Chic. & N. W.	99	111	109	117	122	117	119	116
Chic., R. I. & P.	38 $\frac{1}{2}$	42 $\frac{1}{2}$	49	55	59	60 $\frac{1}{2}$	62	63
Illinoian Central.	52	48 $\frac{1}{2}$	51	51	46	44	44	44
Vandalia Line.	12	11 $\frac{1}{2}$	11 $\frac{1}{2}$	16	16	15	13	13
Chic., Mil. & St. P.	52	58	55	60	56	65 $\frac{1}{2}$	78	78
Han. & St. Jo.	19 $\frac{1}{2}$	17	15	14	15	15 $\frac{1}{2}$	19	21 $\frac{1}{2}$
Mo., Kan. & Tex. ....	.....	.....	.....	.....	22 $\frac{1}{2}$	23	23	23
St. L. I. M. & S.	24	25	29	33	32	31	31	31
Union Pacific.	80 $\frac{1}{2}$	95 $\frac{1}{2}$	105	132 $\frac{1}{2}$	128	108	96	.....
Kansas Pacific.	20 $\frac{1}{2}$	23 $\frac{1}{2}$	22	19	18	19	22	.....
Central Pacific. ....	.....	134	168	173	182	179	179	179

Almost the only roads that did not have a smaller traffic in 1878 than in 1873 are Western roads that have largely increased their mileage, or lead to the districts into which immigration has been heavy of late. Four New England roads show an aggregate decrease of 55 million passenger miles, or more than 15 per cent., in that time; three New York roads a decrease of 12 $\frac{1}{2}$ per cent.; four Pennsylvania roads a decrease of 16 $\frac{1}{2}$ per cent. The Ohio roads also show a notable decrease, and it is only when we reach Illinois that we see indications of an increase; and there such roads as the Chicago & Alton and the Illinois Central, whose mileage had not been increased, share the downward tendency, while the other roads, with few exceptions, had a much greater increase in length of road than in passenger traffic. The two new roads to Texas gained, but the Pacific roads did not.

This confirms the statement made above, that passenger traffic has long been stagnant in this country. And the period of dullness has been longer than is shown by the above table. There are many important roads whose passenger traffic was about as good for the five years after the war as it has ever been since, though in that time their freight traffic has more than quadrupled, and the population of the country has increased probably 35 per cent.

One explanation of this is that passenger traffic to much greater extent than freight traffic is local. Every farmer produces some freight to be sent to the sea-board, but he, if a Western farmer, will probably not go there more than once in his life, if ever, and may not go 50 miles from his farm once a year. The great bulk of the traveling of the community is done on railroads close by them, to the adjacent towns or the nearest large city—very largely to the latter. Now this traffic becomes more and more divided as the railroads multiply. Formerly the people living near the line between Indiana and Illinois, for a hundred miles south of Lake Michigan, when they went to Chicago used the Illinois Central, and most of their traveling was done on that road. When the Chicago & Eastern Illinois Railroad was built, however, they had a nearer road and have since had little or no occasion to use the Illinois Central. This to some extent is true of freight also, it is true, but the new roads bring freight to the old ones to a much greater extent than they do passengers; indeed, in the West, most that they carry to the East has to be carried a thousand miles or more beyond their termini. The settlement of new lands gives a considerable passenger traffic to the routes thither at first, but afterward for some time very little, but a rapidly growing freight traffic. The immigrants are nearly all poor. They restrict themselves very closely to the necessities of life, and travel, when once they have got to their farms, is not a necessity; but the shipment of produce and the forwarding of supplies are. And what traveling they do is for the most part near their homes. This is a phenomenon often observed. There is a rush of immigrants to a certain quarter; the roads leading thither are crowded with passengers and the lumber and supplies needed for establishing them on farms. The rush ceases, the district being perhaps pretty well occupied, and there follows very great dullness in the passenger traffic of the roads that recently were so busy; also a material decrease in the westward shipments, but a rapidly growing eastward movement of freight, a very large part of which goes to increase the traffic of perhaps half a dozen more roads between it and the sea-board. But it is only when the new settler has got a little ahead in the world that he indulges

in railroad traveling even near home, and it is when he feels himself rich, or when some unusual event occurs, that he indulges himself, or any of his family, with a visit to his old home, which is likely to be the first time when he has occasion to use any other than his local road. And this leads to another consideration, which is, that traveling is very largely a luxury, and not one of the elements of production, like freight transportation. It is no measure whatever of the activity of a people in production. The Russian Menonites who have settled in the Far West of late years will probably not travel on the average ten miles a year by rail; but they will be among the most active producers in the country; a single family may deliver 50 or even 100 tons of freight at the nearest station, to be carried very likely 4,500 miles, by rail and water, before it is finally consumed, and so making a freight traffic of 225,000 to 450,000 ton miles, with perhaps not a single passenger mile.

Now, the growth of population and production in this country is greater in the Far West than elsewhere, and before 1879 was very much greater there—was considerable there when there was little or no increase in production in the East. Production there implies a relatively very great amount of transportation. The lines which the Milwaukee & St. Paul and the Chicago & Northwestern are building in Dakota are some 700 miles from Lake Michigan, 1,700 from New York, and 4,500 from Liverpool. The wheat grown on it will largely go to Liverpool, or still farther. Evidently the 80-acre field brought under cultivation there will require much more transportation than one in New York or Ohio or Illinois. Thus it is that freight transportation in this country increases much more rapidly than freight production. The new production requires very much more than the average amount of transportation. Of the increase of population this is not true. The resident of Dakota does not need to do much more traveling than the resident of New York. And, being poorer, once having got there, for several years he will be likely actually to do less, and during that time the railroads between Chicago and the East will sell very few tickets to Dakota people.

But, traveling being to a great extent a luxury, we should expect it to increase when the country is prosperous. And there is an indication of that in the table above. A large number of roads show an increase in passenger traffic in 1879 over 1878, and probably more of them would do so if the year designated as 1879 were the calendar year. But for most of the roads reporting it, is not, but one ending in that year—for many the year ending with September, for several the year ending with June, and for a few a year ending with an earlier month. Now the indications are that the date of the revival of passenger traffic must be put about the first of September or October of 1879. There had been a very general recovery of prosperity for a year before, but after so many years of depression it became the habit of the community to act conservatively, and, moreover, though the return of prosperity that year was shown by the general opening of long closed factories, and the full employment of workmen, it was not a year of great profits to any class. But the following year has been to not a few a year of exceptionally large income, and the result is shown in the very much greater consumption of luxuries, as every jeweler and grocer can testify, and also as the returns of the current year will show, we are sure, a decided growth in passenger traffic.

We have not, however, many figures to support this statement, except the almost universal increase in total railroad earnings, passenger earnings being rarely reported separately till the close of the year; and of course there may be a large increase in total earnings (and often has been) while passenger earnings remain stationary. But something may be gathered from the reports of a single road, the New York Central & Hudson River, which is by far the greatest passenger carrier of the trunk lines, and as a trunk line may be supposed to reflect the condition of passenger traffic for a large part of the country, though on most roads probably, as the first table indicates, passenger traffic began to recover earlier. Now for the ten months of its fiscal year ending with July, the passenger earnings of this road compare as follows with those of the corresponding months of the previous year:

	1879-80.	1878-79.	Per cent. of Inc. in or Dec.	Per cent. of Inc. in or Dec.
October.....	\$846,784	\$653,665	Dec. 1.0	14.5
November.....	570,104	531,619	Inc. 7.3	15.5
December.....	469,067	475,173	Dec. 1.3	36.3
January.....	471,729	419,472	Inc. 12.4	41.0
February.....	428,927	306,933	Dec. 1.8	35.0
March.....	459,435	408,033	" 12.0	25.1
April.....	465,662	412,946	" 12.8	28.6
May.....	503,693	445,975	" 13.0	15.3
June.....	538,692	404,497	" 10.0	49.8
July.....	600,900	523,268	Dec. 15.0	32.3
Ten months.....	\$5,155,023	\$4,701,569	Inc. 9.6	24.4

It appears from this that the passenger earnings on this road hardly began to increase until January, and in January it is questionable whether there would have been any increase but for the snow blockade in 1879, which made the earnings exceptionally small that year. Yet, in these months of almost stationary passenger earnings, freight earnings increased very largely every month. But beginning with February the increase in passenger earnings has been just as decided as, and much more regular than, that in freight earnings, though not so great. And this increase in passenger earnings is more in proportion to the increase of traffic than in the case of freight. The largest branch of the freight traffic, the through shipments eastward, have paid much higher rates this year than last, and the increase of earnings on this account must have been very large on this road. But passenger rates, unfortunately, are as much demoralized as ever, a very considerable fraction of them going to middle men or being otherwise sacrificed. Some of the great increases in the freight earnings are doubtless due very largely to the difference in rates. In June, for instance, nearly all carried through east was on the basis of 10 to 15 cents per 100 lbs. from Chicago to New York; this year 30 and 35 cents were the lowest rates. No such changes have affected the passenger earnings.

We regard this recovery of passenger traffic as an especially significant sign of the times—as an unmistakable sign of greater general prosperity. It has to a certain extent been caused by the increase in immigration, it is true, and that part is not the result of the better incomes of Americans, though it has its own and a very important significance. But the larger part of it, doubtless, is due to the growth of ordinary first-class travel, owing to more active business and to the easier circumstances of the people, and may be expected to continue so long as this general prosperity continues.

The German Railroad Administration.

The organization of the administration of the great Prussian state railroad system has recently been modified, partly with a view to suit it to the greatly enlarged system of the government due to its recently acquiring many important lines, and partly, doubtless, to render it generally more effective. It is worth attention and study here, because the whole subject of railroad organization and administration is unsettled in this country, and principles governing them are scarcely recognized; while in Prussia the art of official administration has been a subject of study and experiment for nearly a century, and of state railroad administration for forty years, and in many important particulars great success has been attained—faithfulness, accuracy, honesty and thoroughness, being characteristics of the whole Prussian civil service, including its railroad service. The methods followed would doubtless be considered intolerably clumsy and indirect to American railroad men, but that will not prevent our learning something from their plan of organization.

The Prussian state railroad system, at the time this organization was adopted, included about 9,400 miles of railroad. As the plan of organization shows, the head of the whole system and the person primarily responsible for its management is the Minister of Public Works. Under him are the "directories," each of which has a railroad system of its own; very recently there were ten such directories, each having generally about a thousand miles of road, though one had 1,600 and one less than 400. These directories are not at all like one of our boards of directors, except that they exercise some of the same powers, but they are professional railroad men, and exercise duties similar to those of the general officers of one of our railroads. The one appointed President has almost unlimited control under the Minister, and assigns duties to his co-directors. They are, however, appointed usually because of qualifications in certain special departments, so that one of them will supervise the machinery department, one the train service, one the accounting department, etc.

Under each directory are several "operating bureaux," as we have called them (*Betriebsamter*). If we consider the head of German "directory" equal to that of one of our large railroads, then we must compare the department of an "operating bureau" with our "division." In length they seem not to be greatly different, as the length under the jurisdiction of a single "operating bureau," so far as we have been able to ascertain, has not greatly exceeded 100 miles. But the German operating bureau consists of a whole staff of officers, sufficient to work a railroad independently, and so far as we have been able to learn its jurisdiction usually extends over a line or lines forming in many respects a little system of itself, rather than a mere section of a long line. Here again the head of the bureau is the responsible officer, by whom the other members have their duties allotted them, though they form together a sort of council, like a board of directors.

The arrangement is favorable to the cultivation of local traffic and attention to local requirements which may be overlooked when there is but one general staff for one or two thousand miles of railroad.

The German system of administration through many different directories has been much praised as avoiding the

evils of too great centralization, and making officials under the Minister to a great extent independent and responsible. To Americans, however, the officers of the directories will appear very much hampered, and deprived of much of the initiative and independence here regarded necessary to successful railroad administration. Much, apparently, depends on the disposition of the Minister, who may meddle very little if he so chooses.

But one thing in this plan should receive general approval, it assumes to establish as definitely as possible just what any given official may do on his own responsibility, and what he must consult his superiors about. How many American railroad officers feel sure of the limits of their own authority? How many, when the time for rapid decision and action comes, are held back by the feeling that if the event is unfortunate their superior will condemn them for not consulting him, though if the step is not taken and it afterward appears that it would have been advantageous, the same superior would be just as ready to complain because they did not "take the responsibility." It is frequently a great help to know what one is authorized to do. There is work enough in deciding what ought to be done, without adding to it by having to consider whether it can be done independently, or must be referred to the superintendent or general manager or president.

The German administration provides a very large number of officers, and does its work in a very regular and systematic way, with a vast deal of what seems to us entirely unnecessary work. There is not the slightest probability that there will ever be anything like it on our railroads; but it has certain qualities which deserve attention, especially by those who have the management of some of the immense railroad systems that are growing up. It is not likely that the largest of these can be properly managed by one general staff, if the general officers give the attention to details that they do on smaller systems. If they do not, then there is a pressing need that there should be another set of officers to attend to these details, and watch over the development of individual members of the great system. We believe it a mistake to suppose that one company with three thousand miles of railroad needs fewer officers than two companies with 1,500 miles each. It needs only half as many heads of departments, perhaps, but more rather than fewer subordinates are required to keep the work as well done and to keep the general officers informed of it and preserve the requisite checks.

The New Chicago Apportionment.

The new Chicago apportionment has been made public in detail, and the percentages of the several roads compared with those of the old apportionment are as follows:

	Freight New.	Live Old.	stock.
Chicago & Grand Trunk	10	6	
Michigan Central	26	31	26
Lake Shore & Michigan Southern	23	26	36
Pittsburgh, Ft. Wayne & Chicago	23	25	26
Pittsburgh, Cincinnati & St. Louis	10	10	
Baltimore & Ohio	8	8	6

The live stock apportionment was made a few months ago conditional on the Grand Trunk's entering the arrangement, and the recent decision of the arbitrators is simply a confirmation of that conditional award. This apportionment covers all shipments since May. The Grand Trunk since that time has been authorized to get whatever it could at full rates, and report. What it obtained will not be much different from what was awarded to it. But no transfers have been made for a long time, and considerable ones are needed to give some of the roads their proper percentages to date, and the "evening" ought to be done before there is another change in the tariff.

It will be seen that of the 10 per cent. of freight awarded to the Chicago & Grand Trunk, 5 per cent. comes from the Michigan Central, 3 from the Lake Shore, and 2 from the Fort Wayne. As we noted last week, the shipments of the year ending with May last, at the current rate through to New York, would have yielded \$12,800,000, and every 1 per cent. of it, therefore, \$128,000. The Michigan Central's share of the rate is about 30 per cent., and the 5 per cent. of freight which it loses may therefore be estimated equivalent to \$192,000 of gross earnings. Most of the live stock that the Chicago & Grand Trunk gets must also come out of it. The 8 per cent. taken from the Michigan Central and the Lake Shore was carried east of Buffalo chiefly by the New York Central and the Erie, and they will both lose—the Central most. But even if it had the whole of the 8 per cent. and it all went to New York (and a very large share of it goes to New England), its earnings from this amount at the current rates would be but about \$480,000, which is about 1½ per cent. of this road's income for the current year, and not more than its increase of earnings in a single month this year. The Pennsylvania's loss over the whole line between Chicago and New York would be \$256,000 in a year. All these estimates of quantities are on the basis of the lowest—the grain and flour—rates, and the lowest rates of this year at that—but not by any means the lowest rates of last year. Still, for the year ending with May last the grain rate doubtless averaged more than 30 cents; for nearly four months it was 40 cents, and this will more than make up for the time from May till Aug. 25, during which it was slowly climbing from about 10 cents to 30 cents. But it will not be safe to calculate that the average rate will be as high hereafter. The price of grain is low, and though it is moving forward in greater quantities than in any previous year, the vessels on the lakes are not so occupied as to enable them to get high rates; and until navigation closes their rates will limit the rates which the railroads will be able to get for grain. Then next season

after navigation opens there will be a good many new vessels on the lakes, and it is extremely doubtful whether a 30-cent rate can be had then. On the whole, we think the railroads will be doing very well if they get an average rate of 30 cents on grain for the current crop year and thereafter under ordinary circumstances. The great bulk of the other through east-bound freight pays five cents more per hundred, and the freight traffic is not going to stop growing by any means; so the figures given above as the earnings of a given percentage of the Chicago traffic are doubtless considerably within the truth.

In live stock, the Lake Shore, it will be seen, has much the largest share. It carries to nearly every important live stock market in the East, including Pittsburgh since the Pittsburgh & Lake Erie was completed, which no other Chicago road does. The Baltimore & Ohio's share, a year ago or more, was taken from the Pennsylvania chiefly, just as now the Chicago & Grand Trunk's share is taken mostly from the Michigan Central.

Began Railroads in 1878.

The reports of the Belgian state railroads show that at the end of 1878 there were in its tracks 4,834,916 wooden ties, 3,957,417 of which had been treated with some preservative. There were also 11,244 iron ties. All but 2,007 ties of the treated ties were creosoted by the Bethell process. The average cost of the ties laid in 1878 was \$1.04 for oak and 47 cents for spruce, and the average cost of creosoting was 13 cents for oak and 31 cents for spruce, making the average cost of a preserved tie \$1.17 for oak and 78 cents for spruce. At the close of 1878 out of a total length of 5,710 miles of rails (not track) in its roads, only 2,355 miles were of steel.

The average number of miles run by a freight car on these roads in 1878 was 5,947; of a passenger train car, 23,104 miles; of a locomotive, 19,000 miles. The average number of cars per express passenger train was 10.4; per ordinary passenger train, 9.8; per freight, 25. The average receipt per train mile was \$1.28; the expense, 77 cents; the profit, 51 cents. The average number of passenger per car was 9, per passenger train, 70.51—the latter much larger than the average in this country, which is not more than 50. The average passenger journey was only 12½ miles, and 22.7 per cent. of the seats were occupied on the average.

The average actual load of loaded freight cars was 6.17 tons, of freight trains, almost exactly 100 tons (99.96) of 2,000 lbs., and the average distance freight was hauled was 43.7 miles. The average load was 42 per cent. of the capacity of the freight cars.

Of the passengers, less than 5 per cent. were first-class, but they yielded 19½ per cent. of the passenger earnings; 13 per cent. were second-class, yielding 22½ per cent. of the earnings, and 82 per cent. were third-class, yielding nearly 58 per cent. of the earnings. The average receipt per passenger was only 15 cents; the average receipt per passenger per mile, 1.16 cents—the lowest in the world, probably, except on some of the East Indian railroads. Nearly 60 per cent. of the whole passenger mileage is on round-trip tickets or at other reduced rates. The average receipt per passenger per mile for passengers traveling at full rates was 1.46 cents, while about 7 per cent. of the whole passenger mileage was made by passengers riding on various kinds of commutation tickets at the average rate of only 0.4 cent per mile, and traveling an average distance of 8.7 miles.

The average rate per ton per mile was 1.4 cents, while the average in the state of New York the same year was 0.99 cent.

The earnings of the state system per mile of road were \$13,217, 13½ per cent. of which was from passengers, and 8½ per cent. from express, baggage, etc., carried on passenger trains.

The expenses were 59.8 per cent. of the receipts, leaving the net earnings \$7,904 per mile. The state in 1878 worked 1,372 miles of road; and the same year 919 miles in Belgium were worked by fifteen different companies, one of which had 280 miles and one 100 miles of road, but no other so much, and eleven had 40 miles or less. The average gross receipts of these companies were \$7,718 per mile (not three-fifths of the state railroads' receipts), the percentage of expenses 56%, and the net earnings \$3,340 per mile.

Taking the whole railroad system of the country together, there were 173 persons killed and 458 injured on it in 1878; four of the killed and 20 of the injured were passengers, 78 killed and 215 injured, employés, and 91 killed and 50 injured, other persons. One passenger out of 4,851,585 was killed or injured on the state railroads; one out of 6,659,329 on the companies' railroads.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Utah & Northern.—Extended from Red Rock, Montana, northward 15 miles. Gauge, 3 feet.

South Florida.—This road is twenty-two miles long, from Sanford, Fla., to Orlando, being 6 miles more than heretofore noted. Gauge, 3 feet.

St. Paul & Duluth.—The *Taylor's Falls Branch* is completed from Wyoming, Minn., eastward to Centre City, 11 miles.

Chicago & Northwestern.—The *Chicago & Dakota* line is extended from Huron, Dak., west 62 miles.

Northern Pacific.—Track has been laid to a point one hundred and five miles west of Bismarck, Dak., an extension of 5 miles.

Louisiana Western.—Completed by laying track from the Mermentau River, La., eastward 15 miles.

New York, Woodhaven & Rockaway.—Completed from Fresh Pond, N. Y., southeast to Rockaway Beach, 12 miles.

Richmond & Allegheny.—Track is laid from Powhatan Furnace, Va., to Morden's Adventure, 23 miles.

This is a total of 149 miles of new railroad, making 2,853 miles thus far this year, against 1,476 miles reported at the same time in 1879, 1,049 miles in 1878, 1,013 miles in 1877, 1,253 miles in 1876, 614 miles in 1875, 962 miles in 1874, 2,252 miles in 1873, and 3,962 miles in 1872.

THE PENNSYLVANIA RAILROAD'S EARNINGS, just reported for July, show a continuation of the large increase of this year. All lines east of Pittsburgh and Erie for that month show an increase of 24 per cent. in gross and of 37½ per cent. in net earnings. July was a bad month for earnings last year, though the traffic was large. August was better, and it can hardly be expected that the increase will continue so large hereafter.

For the seven months ending with July this company has an increase of 25½ per cent. in gross and of 37½ in net earnings. The amount of increase in the latter is no less than \$2,550,000, which is equivalent to 3.7 per cent. on the capital stock. But in addition to this, the stockholders of the Pennsylvania get the benefit of the immense increase in the profits of its vast system of leased lines west of Pittsburgh and Erie, which for the seven months amount to \$2,035,000, which is nearly 3 per cent. more.

The increase on the New York Central for the same seven months was 21.2 per cent., against the Pennsylvania's 25.8; the difference, considering the revival in the iron industry, from which the Pennsylvania largely profits, is natural. The Pennsylvania, however, profits by every addition to the net earnings of its vast system of leased lines, which go into the pockets not of the stockholders of the leased companies but into those of the lessee. The New York Central has no corresponding property, which, likely to reduce the lessee's dividends in very bad times, increases them greatly in very good times.

WATER RATES have changed considerably during the past two weeks. We reported them Aug. 11 as 7 cents a bushel for wheat and 6½ for corn per bushel by lake from Chicago to Buffalo, 5½ for wheat and 5½ for corn by canal from Buffalo to New York, and 8½ by steam from New York to Liverpool. At the end of a week, they had fallen to 5 and 4½ cents by lake, and to about 6½ by ocean, the canal rates remaining stationary. Wednesday of this week (Aug. 25) the quotations were: 5½ cents for wheat and 5 for corn, by lake from Chicago or Milwaukee to Buffalo; 6½ for wheat and 6 for corn, by canal from Buffalo to New York, and 6½ per 60 lbs. for grain, by steam from New York to Liverpool.

NEW PUBLICATIONS.

A Course on the Stresses in Bridge and Roof Trusses, Arched Ribs and Suspension Trusses; prepared for the department of civil engineering at the Rensselaer Polytechnic Institute. By William H. Burr, C.E. New York: John Wiley & Sons, 1880. 8vo, pp. 344 and xii plates.

When a bridge is to be designed there are three very distinct problems that engage the attention of the engineer. First is to be determined the character and amount of the traffic which will be likely to pass over it, the best lengths of the spans, their widths and depths, the general form and proportions of the skeleton trusses, and the position of the roadway relative to the chords. Secondly, the stresses on the various members are to be computed. And thirdly, all the parts are to be proportioned and arranged so as to safely bear for an indefinite time the stresses due to the traffic. The second of these problems is very easy compared with the others, for its solution depends only on the application of simple principles of statics to the assumed data. The determination of the proper data, with the subsequent designing of the cross sections and joints and arrangement of the floor system in all their details, is a very difficult matter, requiring for its successful execution much experience, inventive talent and judgment. For not only should the structure be built so as to be safe, but it should be done at the least expense, and the designer must never for a moment lose sight of the question of economy of material and construction. It is not an easy task to impress considerations of economy upon young students who have no real responsibility in connection with the questions discussed. Yet it does seem as if one of the great faults of technical education in this country is that the methods of instruction tend so little in that direction. Books on the strength of materials are used that contain scarcely a reference to the sizes and proportions of shape iron found in the market. Books on bridges are used that give not a single line concerning their cost. The student knows how to make a drawing of a skew arch, but he very rarely understands how his drawing could be used to make the templates and cut the stones, while concerning the relative cost of cutting different shapes and qualities he knows nothing whatever.

The book before us, as its title shows, deals mainly with the determination of stresses. There are 104 pages on ordinary bridge and roof trusses, 99 on draw-bridges, 50 on iron arches, and 34 on suspension bridges. At the end is a chapter of 35 pages on the details of construction. As the remarks above indicate, we do not like the plan of the work, because it treats so fully of stresses and so little of the other problems of bridge design. We think the average polytechnic student will be more benefited by carefully working out the details of the members and joints for a simple truss than by reading the theory of swing bridges

and arched ribs. But the book itself, regarded as a book on strains, is an excellent one. It is carefully written and the subject is treated thoroughly and well. Both algebraic and graphic methods are presented, while the prominence is given to the former. A single algebraic method is not rigidly followed, but often two or more are given, so that one may serve as a check on the others. Methods are everywhere made subordinate to principles, and for a student no better plan can be followed, since if he be well grounded in fundamental principles he can originate his own methods. The section on draw-bridges will prove of especial value to advanced students and bridge engineers; it is indeed the only presentation of that important subject which is at all suitable to put before a class. The short chapter on the details of construction is a good one as far as it goes, but it should have most certainly included Gordon's formula for struts, and some account of the new German methods for proportioning members according to the range of the stresses to which they are subjected. The theory of the suspension cable and its stiffening truss is given in a simple and yet comprehensive manner. There are doubtless many instructors of engineering who will welcome such a carefully prepared and exhaustive book on the determination of strains.

A Modern Lake Freight Steamer.

The Chicago *Tribune* gives the following description of the "Hiawatha," one of the latest additions to the class of vessels that seems likely to prevail hereafter in the grain carrying trade—namely, propellers adapted to towing a companion sailing vessel :

The improvements adopted in building this new vessel entitle her to a notice at some length from *The Tribune*. She is intended for towing barges, and carrying a large cargo herself. The dimensions are as follows: Length, extreme, 250 ft.; of keel, 236 ft.; beam, 36 ft.; lower hold, 12 ft.; between decks, 7 ft. 6 in., with two full decks, accommodation forecastle, and poop. The engines are double high pressure condensing, 36 in. bore by 46 in. stroke, furnished with steam from two large independent boilers situated between decks. The propeller wheel is 11½ ft. diameter. The machinery is very compact in arrangement, and located as close aft as possible. The fuel is stored in a room forward of the boilers between decks, and the cargo is admitted under all in the lower hold right up to the engine-room bulkhead. There are five bulkheads in the hold, built so as to increase the strength and security of the hold. Sail is spread from three schooner-rigged masts, and there is a fourth for derrick uses near the smoke-stacks. To facilitate performance and management, at sea there is provided a moderate-sized centre-board located abaft the forecastle.

The captain's cabin, rooms for officers who navigate the ship, as well as for seamen, are forward, under and upon a forecastle-deck which extends well aft. From the top of the pilot-house, which is situated upon this deck, a bridge is built at each side out to the sides of the vessel, thus affording the officer handling her the very best means of seeing his way. The dining-hall, engineer's rooms, and those for men in his department are aft under a poop-deck, very snug and comfortable. Several new and original features may be observed in the outfit and tackle, one of the most important consisting in the arrangement of the blocks for the steering chains forward instead of aft, as usual. The new arrangement saves the overhauling and wear of the wire tiller-ropes at least ten feet in placing the rudder from amidship to hard over at either side. Besides this, the chains and blocks are in close view of the officer in charge. The tiller-chains play over a brass casting on the barrel of the wheels fitted to catch and hold the links. Another excellent device is for facilitating the towing of vessels, and consists of a winch with clamp attachment to secure the wire tow-line on board, and of a reel to reel it in on the steamer, instead of hauling it in on the towed vessel in the usual fashion. The tow-winches are also fitted with a coil of springs four feet long to supply elasticity to the line when needed in a sea-way, and the whole apparatus is secured to the tow-post, which in turn is strongly secured to the steamer's sides well forward by heavy iron rods and straps.

The counter and stern of the "Hiawatha" show a marked departure from the usual form of lake steamer. The counter springs from about the eleven-foot draft and inclines aft with an upward turn to the height of upper deck, where an angle is made with the stern, which is circular and has but little rake. This new form gives increased strength to resist the blows of the sea, which are much greater, under certain circumstances, upon the counters and sterns of vessels engaged in towing, than upon those free to rise with the waves.

Another original feature of the "Hiawatha" may be seen upon going on board. This consists in dropping the sheer of the decks forward and aft, so that they are nearly straight from end to end. Outwardly the hull has a good degree of sheer, but inwardly there is only sufficient to run the water to the scuppers. The hatches of the upper deck are very numerous; about half of them extend nearly from side to side for the better accommodation of ore-chutes and elevator legs, and the easier trimming of cargoes. There are coamings to the lower-deck hatches, and the hatches consist of planks that may be taken up or put down at pleasure. Every facility has been adopted for the speedy handling of cargoes, even to the providing of iron discharging barrels, by means of which all bulk cargoes may be hoisted from the hold, rolled on tramways, and delivered by force of gravity at almost any distance from the vessel. When emptied these barrels may be rolled back to the vessel. This ingenious invention is due to the study and experiments of Capt. Alexander McDougal, the commander of the "Hiawatha," who is well known for his success in devices to work ship. This steamer is built of white oak, and is of unusual strength, being iron-strapped outside. The frames are 21 in. from centres of six-inch fitch. The bottom is filled in with six-inch floors between the frames, reaching from bilge to bilge. The keels are 10 by 14 in., placed one foot apart from bilge to bilge in continuous lines from end to end. The cargo-floor is laid crosswise upon these keels, thus securing ample space for water below the cargo should the vessel spring a leak. The bilge-strakes inside and outside are 7 in. thick. The ceiling up the sides is 6 in., while the planking outside is 5 in. thick, with upper and lower wall or fender strakes of 6 in. thickness. The lower-deck beams are 9 by 10, the upper-deck beams 6 by 9, without carlins between.

The "Hiawatha" is owned by Capt. Thomas Wilson and Upson, Walters & Co., of Cleveland. She cost \$100,000, and was designed and built by Linn & Craig, of Gibraltar, Mich. The machinery is from the Dry-Dock Engine Works of Detroit. She will doubtless prove to be one of the very best business vessels on the lakes.

Work at the Paterson Locomotive Shops.

The Paterson (N. J.) *Press* of Aug. 21 has the following interesting notes concerning the three locomotive shops in that city:

There is business enough at the locomotive shops to keep them busy for months to come. At Rogers' they have an engine on the floor for the Atlantic & Great Western, one of the order for 25 heavy engines very like the new Erie freight locomotives. Of the Erie order for five heavy freights, received at the same time that Grant received an order for 10 and Brooks for 15, two have been built and shipped, the second yesterday, and all are under way. They will probably be completed and shipped next week. There are five or six engines on the floor in this shop all the time, and although they have not been turned out very fast until within a few days, now that they have begun to complete them they will be turned out rapidly. There are a number of others to build at this shop, besides the 30 above noted, among the rest several for a Texas road and a number for the St. Louis & San Francisco Railway, two of which, magnificent engines, were shipped this week, the second one yesterday. This shop is now in full operation, though more first-class mechanics could be employed; but not unless they were strictly first-class. In fact, though there are mechanics enough to fully man all the shops, there is a lack of the best class of workmen, and it is remarked by those who are conversant with such matters that we have not been making them of late, not as in years gone by. Workmen, skilled and unskilled, wear out, die, remove; and to repair the waste there should be others constantly learning. There having been but a partial operation so long that but very few men learned in the past years, hence the scarcity. And it is said that there is little disposition shown to teach green hands now. Many of the men working at the shops, at Rogers' especially, are Cubans and Mexicans, who develop a great aptitude for mechanics.

At Grant's, the order for 10 heavy Eries, received at the same time as the Rogers' five, has long since been filled and now they have another order, or balance of the first, for 10 or 15 more for the Erie, making 50 in all, which was the number proposed to have built. But at Grant's there is a deal of work ahead of this latter order, and there is no especial hurry, for there is ample time until January, for both shops to finish their Erie orders; the same time is given to the Danforth works to fill their order for the 10 standard passenger locomotives for the Erie. At these works there is a great activity, and there is all that can be done for months to come. The machine-building portion of the works is also in full blast, with plenty to do. At Grant's there is no little speculation over the possible success of the queer locomotive briefly described recently. This is being built for the inventor, a Kentuckian, we believe, as an experiment, the claim being that it will achieve great speed; work on this is progressing rapidly. The boiler is an ordinary one, without peculiarity. This strange engine will stand up like a double-decker and what with the elevation of the engine's cab, up by the smoke-stack, and the immense height of the machinery anyway, one set of driving wheels on top of another, and all that, we would not care to be the man to drive it. It has been suggested that the inventor be placed up in the second story or attic, and then if any one is hurt it will be the party who is responsible for its construction. The connecting-rods, instead of leading downward from the piston to the driving-wheels in this engine, will reach upward to the first drivers, atop of the second drivers. We believe the first are to make but one revolution to the latter's three, or thereabouts. There is much claimed for the engine in the way of speed, and good mechanics approve of the principle in part, but shake their heads over the great friction that must be caused by such a gearing. There is to be a hydraulic pressure brought to bear in some way on the top drivers to press them to the others beneath, so that the adhesion may be sufficient to drive the latter.

The following will show the total number of locomotives turned out at all the shops in the first six months of the years 1879 and 1880, which will serve for a comparison:

	1879.	1880.
January	12	13
February	12	16
March	14	8
April	8	21
May	4	24
June	20	29
	70	111

The above shows a great gain this year over last. There was a time in March last when, as now, in the latter part of July and first of August, a deal of new work was undertaken and engines were not turned out so fast for a time; but after a start was made on the new orders they were rolled out rapidly. If all goes well, it will be very like that when the Erie and the Atlantic & Great Western engines begin to come forth finished. Last month (July) 22 locomotives were shipped, and this month but 13, so far. Usually it is expected, when all goes well, to complete one at the shops on each working day, taking one with another.

The large engine shipped this week for the Delaware, Lackawanna & Western road, from Danforth's, was the first of its class ever built in Paterson. It looks a monster, and is among the largest built; but the chief feature about it is that through an application of Wooten's patent boiler, including fire box, this locomotive will burn what is known as culm, or "buckwheat," the dust arising from the manipulation of coal and of which there are actually mountains in the coal regions in the vicinity of the mines. The great difficulty is to get rid of it. There is no value to it, and it will be readily understood what an advantage it is to have engines that will burn this stuff, and especially so to the Delaware, Lackawanna & Western road, which runs right into the mines, so that this dust can be procured without either labor or cost. The inventor of this peculiar fire box is J. E. Wooten, General Superintendent of the Philadelphia & Reading Railway, and the invention is already in use in engines on his own road and on the Delaware, Lackawanna & Western. The engine shipped this week was the first of an order for five of the same class, all to be made with boilers and fire-box after Wooten's design.

Prize for an Improved Cattle Car.

At the meeting of the American Humane Association, in Chicago, in October, 1879, it was resolved to offer a prize for an improved cattle car in which animals can lie down and can be watered and fed on their journey to market. The sum of \$5,000 has been subscribed for this prize, and nearly all of it paid in and deposited with Kidder, Peabody & Co., of Boston. The following judges have been selected to award the prize: Edwin Lee Brown, President of the Association; John B. Winslow, of Boston; A. Kimball, General Superintendent of the Chicago, Rock Island & Pacific; Wm. Monroe, of

Brighton, Mass., and E. T. Jeffery, General Superintendent of the Illinois Central. These judges have issued a circular stating the conditions under which the prize will be awarded, as follows:

We desire to say that competitors will take out patents for their inventions, before submitting them to us, or not, as each shall choose; but we must be fully satisfied of the legal title of a claimant to his invention, before awarding to him the prize, or any part thereof; and he must also convey to the American Humane Association, or to such persons as its Executive Committee shall designate, a patent for the United States and Canada of the invention, which shall be satisfactory to said committee, before any part of the prize-money will be due to him.

As models and plans may be seen by others than ourselves while in our possession, we suggest, as a precautionary measure, that each inventor file a caveat at the United States Patent Office before sending them to us.

We do not prescribe the size or the internal arrangement of the needed car; but among plans which meet the conditions, that will have the preference which can most readily and cheaply be adapted to the cattle-car now in use. Of course, also, that car which can be most easily adapted to the transportation of other live animals and merchandise, if in other respects satisfactory, will have our preference.

We reserve the right to withhold any award, if, in our judgment, no plan shall be offered which fairly meets the requirements.

We reserve the right also of dividing the \$5,000 into two or more prizes to different inventors, if we shall think that the end in view by the American Humane Association requires it. All the reasonable legal expenses which shall be incurred by us in determining the originality and validity of the patents of successful competitors will be deducted from the prize awarded each.

It seems to us just to require, and we do require, that all express and other expenses upon packages or boxes sent to us shall be prepaid. All models and plans will have reasonable care while in our possession at Chicago, but will be at the risk of each owner.

After our decision has been reached, each article will be returned to its owner in the manner he shall direct, and at his risk and expense. It is also required that all letters sent to the judges, to which answers are expected, shall contain the proper stamp for the reply.

Our decision will be reached as soon after the first day of October next as we shall find practicable, and will be communicated to the Executive Committee of the American Humane Association immediately thereafter. The judges name Oct. 1, 1880, rather than six months after the issuing of this circular, because the fact that such an offer would be made was widely published in the scientific, mechanical and other newspapers in this and other countries immediately after the passage of the vote of the Humane Association in October last; and that it has been very widely known and considered by inventors, is shown by the fact that already more than 300 persons have given their names to the Association as competitors for the prize, and have their plans ready to send us.

We think that personal interviews with competitors or their friends are wholly unnecessary, and we shall make up our judgment from the models or plans, and the descriptions that accompany them. Of course we reserve the right to call for written explanations in any case where it shall seem to us necessary.

All competitors for the prize are required to send their models and plans, with full descriptions, to Edwin Lee Brown, northwest corner Clinton and Jackson streets, Chicago, Ill., as early as may suit their convenience; but not later than the first day of October next. All communications, also, in regard to the prize should be addressed to Mr. Brown, as above.

Examination for Color-Blindness in Connecticut.

A correspondent of the New York *Herald* writing from Norwich, Conn., speaks as follows of the examinations for color-blindness in that state, giving, apparently, that view of the subject which is taken by many of the railroad men:

Railroad men throughout the state of Connecticut are greatly stirred up over the action of the State Board of Health in executing the law enacted by the last Legislature regarding color-blindness and defective visual power. The act reads as follows:

"On or before Oct. 1, 1880, all the railroad companies shall cause every person in their employ, as locomotive engineers, firemen, conductors, brakemen, station agents, switchmen, flagmen, gate-tenders, or signal-men, to be examined at the expense of the railroad company in regard to color-blindness and visual power, and under such rules as the Board of Health shall prescribe; and any corporation employing a person not possessing a certificate showing that he has passed a successful examination shall be liable to a fine of from \$200 to \$1,000.

In the examination the Board of Health have divided the employees into two classes. In the first class are engineers, firemen and brakemen, and the second class comprises the others. A man holding a second-class certificate cannot work as an engineer, fireman or brakeman without first passing a first-class examination. To obtain a first-class certificate it is necessary to have, according to the requirements of the Board, healthy eyes and eyelids, without habitual congestion or inflammation; unobstructed visual field, normal visual acuteness, freedom from color-blindness, entire absence of cataract or other progressive disease of the eyes. A second-class certificate requires healthy eyes and eyelids, without habitual congestion or inflammation; unobstructed visual field, visual acuteness at least equal to three-fifths without glasses, and normal with glasses in one eye and at least one-half in the other eye with glasses; and there must also be a freedom from color-blindness in one eye, and color perception at least equal to three-quarters in the other eye. Dr. William T. Bacon, of Hartford, and Professor William H. Carmalt, of Yale College, were appointed by the Board to make the examination, the state being divided between them. Their test for color-blindness is what is known as the "worsted" one, and it has worsted many a coal-begrimed trainman during the past fortnight. He is made to take up one of the skeins and select from a large pile at hand all the shades of that color. In testing the power of the eyesight the leading trial is that of stationing the person who is being examined 25 feet away from a board, upon which are letters and figures $\frac{1}{4}$ in. long. He must be able to name any and all of them, closing each eye in turn.

Professor Carmalt has tested the men on the New York & New Haven Railroad and on the southern lines in the state. Engineer Charles Bullard, of the Shore Line road, who has run over its rails since they were first laid, was the first man found deficient, and Engineer William Fisher, of the New York line, another experienced man, was the second. Bullard could not see the letters and Fisher could read them only with one eye. This decision of the examiners, after they had also reported defects in the orbs of Engineer Chard

and Conductor Fowler, of the Shore Line route, threw other trainmen into a frenzy of alarm, and a mass meeting of engineers was at once held in New Haven questioning the fairness of the tests used by the committee. They were backed by the most influential officials of the state railroads, and declared that the proper tests of their eyesight should be made by using simply the red, white and green lanterns and flags and the 8 and 12-in. letters used on the signboards of the railways, they to be on their locomotives. They considered it to be unfair to be bewildered by a host of colors in a room, and with letters less than one-sixteenth the size they have become habituated to or use.

The result of the meeting was the circulation of a petition throughout the state asking the Board of Health to modify the methods of examination. This is signed, it is believed, by nearly all the prominent railroad men in Connecticut. It was the intention of the petitioners, if their prayer was not granted, to test the matter in the courts, and thus gain time till the next session of the General Assembly, when a vehement effort will be made to induce the legislature to modify the law.

On Thursday Dr. Bacon began the examination of the employés of the New London Northern Railroad in company with the paymaster of the line. Out of 38 men tested in that city but one was found visually deficient, and yesterday the examination was proceeded with at Montville, and in the afternoon was begun in this city, when a telegram from the secretary of the State Board of Health ordered Dr. Bacon to desist from further tests till directed to continue them. The tidings of the dispatch soon became bruited among the crowd of employés who were nervously and anxiously awaiting their trial, and for a few minutes a happier lot of men one seldom sees.

Many democrats in this section are already making political capital out of the present situation. They claim that the law was passed by a republican Legislature, and that it has already done much to insure democratic success in this state next fall. And they further declare that the Board of Health has been induced to stop the examination through motives of policy looking forward to the autumnal election.

The Examining Committee say its tests are in every way accurate and recognized the world over as the standard; that men who cannot pass the tests cannot pass any other reliable ones, and that it is impossible to make mistakes in it. Of the hundreds of men already examined 4 per cent. were, to a greater or less extent, color-blind and 6 per cent. defective in visual power.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends have been declared as follows: *Chicago, Burlington & Quincy*, 2 per cent., quarterly, payable Sept. 15. Transfer-books closed Aug. 24.

Foreclosure Sales.

The *Galveston, Brazos & Colorado* road was to have been sold in Galveston, Tex., Aug. 24, under foreclosure of mortgage. The sale was, however, postponed until Nov. 30, some of the floating debt creditors having applied for an injunction to prevent it.

West-Bound Classification Meeting.

The committee appointed at the general meeting held at the Kennard House, Cleveland, Aug. 10, to prepare a west-bound classification to be adopted from all points west of and including Buffalo, Black Rock, Suspension Bridge, Dunkirk, Erie, Salamanca, Pittsburgh and Wheeling, report that they have completed their labors, and call a general meeting of all roads west of above-named points, to be held at the Grand Pacific Hotel, Chicago, Wednesday, Sept. 1, 1880, at 11 a. m., when the proposed classification will be presented for approval of all interested.

All roads west of Chicago and the Mississippi River are invited to be represented at this meeting, to discuss the question of joining Eastern roads in a uniform west-bound classification.

The Committee consists of Messrs. G. H. Vaillant, James Means, Frank Harriott, A. H. McLeod, W. H. Stewart, H. W. Gays, J. A. Grier, G. G. Cochran and J. A. Moore.

ELECTIONS AND APPOINTMENTS.

Boston, Hoosac Tunnel & Western.—At the annual meeting in Saratoga, N. Y., Aug. 18, the following directors were chosen: George I. Post, Fairhaven, N. Y.; George R. Blanchard, New York; Coe F. Young, Honesdale, Pa.; Frederick L. Ames, Oliver Ames, North Easton, Mass.; John B. Alley, Lynn, Mass.; John R. Brewer, Hingham, Mass.; John W. Candler, Brookline, Mass.; Elisha Atkins, Wm. L. Burt, F. Gordon Dexter, A. A. Gaddis, Silas Pierce, Boston. The only new director is Mr. Pierce, who succeeds S. S. Guthrie.

Baltimore & Ohio.—Mr. Lyman McCarty is appointed General Western Passenger Agent, with office in Kansas City, Mo. His territory will include the Missouri River points, Missouri, Kansas and Colorado.

Burlington & Missouri River in Nebraska.—Mr. J. M. Barr is appointed Car Accountant, with office at Omaha, Nebraska.

Chicago & Alton.—Col. J. H. Wood, for some time past Division Superintendent, has been assigned to duty in connection with the General Manager's office, with the title of General Manager's Assistant.

Cincinnati, Sandusky & Cleveland.—Mr. Joseph S. Porter has been appointed Master Mechanic, in place of Benjamin S. Gregg, deceased.

East Texas.—Mr. R. H. Cousins has been appointed Chief Engineer, with office in Beaumont, Tex. He was recently Agent at Dallas for the Houston & Texas Central.

Fond du Lac, Amboy & Peoria.—Mr. H. W. Keyes has been appointed General Freight Agent, in place of B. H. O'Meara, resigned.

Frankfort & Kokomo.—General Manager Waldron has made the following appointments: J. B. Clark, Superintendent; A. D. Thomas, Assistant Treasurer and Paymaster; A. J. Castater, Auditor; E. H. Andress, Purchasing Agent; W. S. Weed, General Freight Agent; G. W. Smith, General Passenger Agent; H. L. Cooper, Superintendent of Equipment; T. H. Ferry, Chief Engineer; F. F. Hagedorn, Superintendent of Bridges and Buildings. The general offices of the company will be at LaFayette, Ind. These are all officers of the Lake Erie & Western road also.

Indianapolis, Decatur & Springfield.—The offices of General Freight Agent and General Passenger Agent have been abolished, and their duties will be performed by G. Z. Nuter, Traffic Manager.

New York Central & Hudson River.—Mr. Louis D. Heus-

ner has been appointed Western Passenger Agent in place of James Brown, deceased. Communications should be addressed to him at No. 66 Clark street, Chicago, Ill.

New York, Lackawanna & Western.—The directors of this new company are: John I. Blair, Blairstown, N. J.; Benjamin G. Clark, Jersey City, N. J.; Walter S. Gurnee, Irvington, N. Y.; Samuel Sloan, E. S. Higgins, George Bliss, Percy R. Pyne, Wm. E. Dodge, Jay Gould, Sidney Dillon, John F. Dillon, Solon Humphreys, Russell Sage, New York.

Mexican Central.—At a meeting of the board in Boston, Aug. 24, Mr. F. de Funiki was chosen General Manager. We are not advised whether Mr. de Funiki will accept the position or not.

Peoria & Springfield.—At the recent annual meeting the following officers were elected: President, James Haines; Vice-President, A. J. Ware; Secretary, B. S. Prettyman; Treasurer, D. T. Thompson.

South Florida.—The officers of this company are: E. W. Henck, President; E. F. Crafts, Secretary; C. C. Haskell, Treasurer; F. C. Tucker, Chief Engineer. The company's office is at Longwood, Orange County, Florida.

United States Rolling Stock Co.—Mr. H. R. Torrey, formerly on the Chicago, Burlington & Quincy, is now Master Mechanic in charge of this company's shops at Urbana, Ohio.

Washington City, Virginia Midland & Great Southern.—Mr. Mercer Slaughter has been appointed General Ticket Agent, in place of James M. Broadus, deceased.

Western North Carolina.—The new company was finally organized at a meeting held in Salisbury, N. C., Aug. 21, when the following directors were chosen: W. E. Anderson, T. M. Logan, A. B. Andrews, F. F. Millar, A. C. Avery, John Hoey, W. T. Dorth, Robt. B. Vance, W. J. Best. The board elected W. T. J. Best, President. The directors are the same who were chosen in New York several weeks ago, and the present meeting was held to obviate any question as to the legality of a meeting held outside of the state.

PERSONAL.

Mr. B. H. O'Meara, General Freight Agent of the Fond du Lac, Amboy & Peoria, has resigned to take a fast freight line agency in Iowa.

Mr. Charles B. Peck, General Manager of the Chicago & Grand Trunk, is on the Republican state ticket in Michigan as presidential elector at large.

Mr. Benjamin J. Gregg, Master Mechanic of the Cincinnati, Sandusky & Cleveland road, died July 31, at his home in Sandusky, O., of congestion of the lungs.

Mr. G. F. Boyd has resigned his office as General Passenger Agent of the Indianapolis, Decatur & Springfield, and has accepted a position in the passenger department of the Rock Island road.

The reported resignation of Mr. E. B. Stahlman, traffic manager of the Louisville & Nashville, is denied by authority. It is said, however, that Mr. Stahlman will take a leave of absence for several months on account of his health.

Mr. E. H. Waldron, whose appointment as General Manager of the Frankfort & Kokomo road was noted last week, continues to be General Manager of the Lake Erie & Western road. The Frankfort & Kokomo is a short connecting line, and he undertakes its charge in addition to his other duties.

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods have been reported as follows:

Seven months ending July 31:

	1880.	1879.	Inc. or Dec.	P. c.
Nash., Chatta. & St. L.	\$1,176,200	\$971,477	I. \$204,822	21.1
Net earnings	497,301	330,027	I. 158,274	46.7
Northern Central	2,066,088	2,158,045	I. 507,143	23.6
Net earnings	850,238	522,807	I. 327,431	62.5
Pennsylvania	22,883,715	18,196,064	I. 4,686,751	25.8
Net earnings	9,306,714	6,845,271	I. 2,551,443	37.2
Phila. & Reading	9,472,301	7,998,189	I. 1,474,112	12.4
Pitts. Titusville & Buff.	316,639	270,872	I. 45,967	17.0
Net earnings	146,288	98,042	I. 48,246	49.2

Month of June:

St. John & Maine	\$7,428	\$8,657	D.	\$1,220	14.2
Deficit	517	1,820	D.	1,303	71.6

Month of July:

Nash., Chatta. & St. Louis	\$151,504	\$133,500	I.	\$18,004	13.5
Northern Central	450,297	324,424	I.	125,873	38.8
Pennsylvania	3,440,644	2,782,900	I.	666,738	23.8
Net earnings	1,302,503	960,615	I.	302,890	30.3
Phila. & Reading	1,282,834	1,303,521	D.	20,313	1.6
Pitts. Titusville & Buff.	54,660	38,251	I.	16,409	42.8
South. Pac., No. Div.	87,000	80,861	I.	6,199	7.7

Second week in August:

Chi. & Eastern Ill.	\$33,535	\$10,482	I.	\$17,043	103.3
St. L. Iron Mt. & So.	144,900	101,329	I.	43,571	43.0

Third week in August:

Denver & Rio G.	\$35,170	\$28,449	I.	\$56,721	199.4
Grand Trunk	I.	.....	.....

Week ending Aug. 14:

Grand Trunk	.....	.....	I.	.....	.....
.....	.....	.....	I.	.....	.....

Grain Movement.

For the week ending Aug. 14 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past eight years:

Northwestern Shipments.

Year.	Receipts	Total	By rail.	by ralt.	Receipts	P. c.	Atlantic
1873.	5,610,407	3,769,262	565,031	15.8	2,451,799		
1874.	4,944,590	3,076,530	485,712	15.8	2,872,268		
1875.	3,684,008	2,653,444	712,402	26.9	3,003,929		
1876.	3,026,489	3,764,548	1,614,256	42.8	2,913,160		
1877.	5,455,352	4,426,953	933,681	21.1	4,589,353		
1878.	8,147,091	5,328,243	1,497,000	28.1	6,417,891		
1879.	6,208,677	6,335,513	1,705,237	26.9	7,685,354		
1880.	7,043,310	6,635,931	2,105,119	31.9	8,193,507		

The receipts of the Northwestern markets for the last four weeks have been exceeded but four times this year, and but four times in the whole year 1879. About 38 per cent. of them were wheat and 48 per cent. corn. The shipments of these markets were a little larger than the week before, and are the largest since June. Wheat formed about 39 per cent. and corn 47 per cent. of these shipments. The rail shipments are among the largest ever made while navigation was open. Atlantic receipts were a trifle less than the week before and have been exceeded four times this year, but only three times in all last year, and never before.

Of the Northwestern receipts, Chicago had 48.1 per cent., Toledo, 21.4, St. Louis 18, Peoria 8.9, Cleveland, 3.9, Detroit, 2.4, Milwaukee 1.8, and Duluth 1.2 per cent. Toledo's receipts are extraordinarily large, indicating a very heavy

business on the Wabash road; they are nearly all wheat and make up nearly half of the total wheat receipts. St. Louis stands next in wheat receipts, with less than half the quantity; Chicago follows, with little more than a sixth of the wheat, but with nearly three-fourths of all the corn. Milwaukee's receipts continue insignificant. In every particular, it will be noticed the movement was larger than last year—Northwestern receipts 22 per cent., Northwestern total shipments 5 per cent., Northwestern rail shipments 23/4 per cent., and Atlantic receipts 7 per cent. larger.

For four successive weeks the exports of Atlantic ports have been:

	Aug. 18.	Aug. 11.	Aug. 4.	July 28.
Flour, bbls.	97,585	71,183	110,477	63,647
Grain, bush.	8,161,262	6,495,959	7,986,382	6,205,671

Thus the last week's grain exports are the largest of the four weeks, and are doubtless among the largest ever made, those which were reported to be nearly 9,000,000 ten weeks before having been actually a million bushels less.

he Chicago & Northwestern exactly) as follows by the Chicago Tribune:	
Chicago & Alton.....	15,000
Michigan Central.....	12,000
Illinois Central.....	7,000
Chicago, Burlington & Quincy.....	10,000
Chicago & Northwestern.....	25,891
Pittsburgh, Fort Wayne & Chicago.....	7,000
Baltimore & Ohio.....	3,000
Chicago, Milwaukee & St. Paul.....	10,000
Pittsburgh, Cincinnati & St. Louis.....	9,000
Chicago, Rock Island & Pacific.....	8,000
Lake Shore & Michigan Southern.....	10,000
By other routes.....	5,000
Total.....	121,891

These were largely carried in special trains and at reduced rates. A great deal of cutting from the southwest was reported on Templar tickets, and some of the roads that had a large traffic probably did not make a great deal out of it.

The Southern Railroad War.

A dispatch from Chicago, Aug. 24, says: "Vice-President Alexander, of the Louisville & Nashville Railroad, and General Manager Clark, of the Chicago, St. Louis & New Orleans Railroad, met here to-day, and after full conference and examination of the points of difference between their lines, agreed upon a basis of operations and interchange of business in future. These gentlemen sent joint telegrams to their offices in New Orleans, Louisville and other points of competition to stop all cutting of rates at once, and to at once resume the status that existed in rates prior to the opening of the contest which has waged between these lines for the last two months. All rates are to be restored at once. The officers of the respective lines are to meet in Louisville, Sept. 1, to settle details and arrange future relations between the companies."

Chicago Shipments Eastward.

For the week ending Aug. 21, the total shipments eastward under the pooling agreement of the six roads were 29,436 tons, against 33,285 the week ending Aug. 14, 35,008 the week ending Aug. 7, and 25,568 the week ending July 31. The total rail shipments from the West have been unusually large of late, but they are mostly from local points in the interior and from places too far south to reach the lakes without considerable expense, or from Toledo, which is too near Buffalo to make it pay to make two transfers for the sake of the difference between rail and lake rates, except under peculiar circumstances. The average rail shipments from Chicago for the last year reported, were about 41,800 tons per week, and the largest in any one week were 85,000 tons, last March.

THE SCRAP HEAP.

Railroad Equipment Notes.

The Ohio Falls Car Co., at Jeffersonville, Ind., is building four very handsome passenger coaches, finished in Eastlake style, for the Louisville, New Albany & Chicago. They are for the through Louisville-Chicago trains lately put on.

The Lebanon Manufacturing Co., at Lebanon, Pa., is shipping new box cars to the New York, Lake Erie & Western road.

The Bass Foundry & Machine Works, at Ft. Wayne, Ind., now employ over 600 men, and are full of orders for wheels and other railroad castings. The Chicago branch is also very busy.

The Chicago & Eastern Illinois shops are building a lot of coal cars, to carry 16 tons each.

The Mt. Clare shops of the Baltimore & Ohio road, in Baltimore, are building 50 refrigerator cars.

The Lehigh Car & Manufacturing Co., at Stenton, Pa., has taken an order for 300 box cars and 200 gondolas for the Missouri Pacific road.

The Pullman Car Shops in Detroit have just turned out two very handsome sleeping cars to run between Boston and Montreal by the Boston, Concord & Montreal and Passumpsic lines.

The Baldwin Locomotive Works in Philadelphia have this month shipped 12 locomotives and several street motors to Australia.

Iron and Manufacturing Notes.

The Chickies Iron Co., at Chickies, Pa., has started up its rolling mill.

The rail mill of the Roane Iron Co., at Chattanooga, Tenn., turned out 2,000 tons of iron and steel rails in July.

Bartow Furnace, in Bartow County, Ga., will be started up soon, using Tennessee coke for fuel.

Keystone Furnace, in Easton, Pa., is being thoroughly repaired.

The furnace of James Hooven & Son, at Norristown, Pa., is being repaired, and will, it is expected, go into blast early in Oct. over.

Only 18 furnaces were in blast on the line of the Philadelphia & Reading Railroad at this time last year. Now there are 49 in blast, with 37 awaiting a certainty of a steady continuance of the advance to operations. On the line of the Lehigh the number of furnaces is less, but the proportion at work is greater. Out of 40 furnaces, 30 are in blast and 10 out.—*Reading Times and Dispatch*.

The new rolling mill of Samuel Seyfert, in Robeson township, Berks County, Pa., is nearly completed and is to start up next week. It is furnished with the latest improvements in machinery.

Most of the machinery at the Henry Johnson Steel Rolling Mill, near Catasauqua, Pa., is now in position, and as soon as the new addition to the main building has been completed the works will go into operation.

Mary Furnace, at Lowellville, O., owned by the Ohio Iron & Steel Co., is having several improvements made by which its capacity for production will be largely increased.

The Brier Hill Iron & Coal Co. has two of its furnaces near Youngstown, O., in blast, making about 1,000 tons of pig-iron weekly. The third furnace is being rebuilt, and will soon be ready to go into blast.

Bridge Notes.

The Baltimore Bridge Co. will build the draw-span, 330 ft. long, and several fixed spans for the new bridge over the Mississippi at Sabula, Ia., on the Chicago, Milwaukee & St. Paul.

The Columbia Bridge Works of D. H. & C. C. Morrison, at Dayton, O., have lately taken several contracts for highway bridges.

The contract for two new spans of iron highway bridge over the Passaic River at Newark, N. J., has been awarded to the New York Bridge Co. and the Perkins Patent Iron Shutter Co.

Clarke, Reeves & Co., at Phoenixville, Pa., have taken a contract for an iron bridge 800 ft. long over the Merrimac River at Haverhill, Mass., on the Boston & Maine road.

The Penn Bridge Co., at Pittsburgh, is building one span of 125 ft. for the Pittsburgh, Cincinnati & St. Louis road; a highway bridge of 150 ft. span at Grenada, Miss.; one of two spans, 90 ft. each, at Eagle, Mich., and five small bridges in Fayette County, Ohio.

Prices of Rails.

Steel rails are firmer and sales are reported at \$62.50 to \$65 per ton, the latter price for this year's delivery. Not much new business is reported, buyers looking for some concession in prices.

Iron rails are not active, though the mills are generally pretty well supplied with orders. Sales are reported at prices varying from \$46 per ton at mill for 56-lb. section to \$50 for 16-lb., and the market is considered firm.

Old iron rails are unchanged and sales of small lots are reported in Philadelphia at \$27 to \$28 per ton.

Pittsburgh quotations for spikes are 2½ cents per pound; track bolts, 4 to 4½ cents for hexagon and 3½ to 3¾ for square nuts; fish-plates, 2½ to 2¾ cents per pound.

British Iron Exports.

The revival of exports of iron to the United States from Great Britain first began to be felt a year ago. Comparing the exports of iron and steel of all kinds for the year ending with July, we find the following for three years:

	1878-80.	1878-79.	1877-78.
To the United States.....	1,604,625	218,680	142,112
To other countries.....	2,254,328	2,186,093	2,190,419

Total..... 3,855,953 2,404,773 2,332,531

Thus the exports to the United States the last year were almost eight times as great as the year before, and eleven times as great as the year before that. Moreover, in the exports to other countries, there has been very little change, so that substantially the whole of the immense increase (60 per cent.) in British iron exports is due to the demand in the United States. But these exports have begun to fall off, and, in July last, were less than 80,000 tons, while for the previous six months they had averaged 164,500 tons, or more than twice as much. The decline in rail exports is not quite so great in proportion, but still is great, as the July exports to the United States were but 14,845 tons, while for the six months previous they were 128,088, or at the average rate of 21,348 tons per month.

The total exports of rails from Great Britain for July and for the seven months have been:

July:	1880.	1879.	Increase. P. c.
Steel rails.....	53,798	12,864	20,934 64.0
Iron rails.....	10,745	3,955	6,790 170.0

Total..... 64,543 36,810 27,724 75.3

Seven Months:	1880.	1879.	Increase. P. c.
Steel.....	287,357	184,623	102,734 55.6
Iron.....	94,526	23,223	71,303 307.0

Total..... 381,883 207,846 174,037 84.0

Of these exports for the seven months 37 per cent. went to the United States this year against 4.3 per cent. last year. It is the largest importer this year, followed by British India and British North America, and Australia. British colonies altogether have nearly 50 per cent. of the whole this year, so that English speaking countries have taken about seven eighths of the British exports this year.

The quantity of rails imported by the United States this year would suffice to lay 1,624 miles of track with 56-lb. rails.

Government Contracts.

Lieutenant-Colonel Q. A. Gillmore, United States Engineer, will receive at his office in the Army Building, New York, until Sept. 7, bids for dredging in the harbor of Brunswick, Ga., and in Inside Passage between Fernandina and the St. John's River in Florida. Also, until Sept. 14, for building jetties of logs, brush and stone in the harbor of Charleston, S. C.

A New Postal Car.

One of the new postal cars now running on the Chicago, Milwaukee & St. Paul road, arrived at the Vine street depot Tuesday for the second time. It is the first one constructed of the three mail cars which have been added to the postal service, all of which are to be exactly alike. The car is one of the largest and most complete in its appointments of any in the service. It was designed and constructed under the plan of Mr. C. R. Harrison, of Milwaukee, who holds the important position of Superintendent of mail cars for the Sixth Division. It is 65 ft. long, including platforms, and 60 ft. in the clear; 9 ft. 2 in. wide, and contains, among other novelties, Mr. Harrison's patent pouch-holders, the frames of which are so arranged that they can be taken apart and laid against the side of the car, leaving a clear open space; then as many or as few as are needed can be put in position. Moveable tables which can be placed at any desired point in front of pouches for holding the letters or papers to be distributed, are one of the most important features of the interior arrangement. These pouch-holders and tables occupy the central position of the car. Above them are boxes for containing mail matter of various kinds. At one end are located boxes, whose capacity is doubled by being reversible. There are 480 in all in this car, and 24 stationary, making 984 letter boxes. At the other end of the car is what the boys prize very greatly—a rack holding several spring couches, which can be placed anywhere in the car if no pouches are there to interfere. The facilities for lighting the car are nearly perfect—the skylights and windows for day use, and a pair of chandeliers, also of Mr. Harrison's patent, are suspended from the ceiling. They have reflectors, quickly adjustable to any desired position. The car is neat, but the main recommendation is its complete adaptation to the needs of the service.—*La Crosse (Wis.) Republican*.

Maps Needed.

The following paragraph from the items for investors of the New York *World* contains about as much misinformation as could possibly be condensed into one sentence:

"The St. Louis, Arkansas & Texas Railroad (a branch of the St. Louis, Iron Mountain & Southern Railway) has opened a new station on the main line at the junction of the St. Louis & San Francisco and the St. Louis, Alton & Terre Haute railroads, at Plymouth, four miles this side of Peirce City. The new line is extended several miles beyond Plymouth, and is being rapidly pushed forward toward Eureka Springs."

Maps are apparently very scarce in the *World* office.

The Westinghouse Brake in Europe.

The Westinghouse Brake Co. has issued a circular which shows that up to July 20 last the total number of Westinghouse automatic brakes fitted or ordered to be fitted on English lines was 456 engines and 2,942 carriages; in France, 203 engines and 1,609 carriages; in Belgium, 197 engines and 1,241 carriages; in Germany, 55 engines and 93 carriages; Russia, 36 engines and 51 carriages; Holland, 28 engines and 117 carriages; New South Wales government lines, 58 engines and 124 carriages; South Australian government lines, 23 engines and 18 carriages. In the United States it is used by 130 railroads, on 2,211 engines and 7,224 carriages. With a few on the lines of several other countries, the total is 3,277 and 18,502, while the non-automatic system is fitted on 2,472 engines and 8,812 carriages. The Westinghouse Co. has also arranged to fit carriages with a vapor of gasoline light, produced by passing compressed air

through a sponge saturated with gasoline. A new arrangement of communication for passengers has also been arranged in connection with the brakes.—*London Engineer*.

More Westinghouse Inventions.

The Westinghouse Continuous Brake Company of London in circular issued July 28 says:

"After experimenting for several years at great expense, both here and in America, we have perfected a system for lighting railway carriages, in which the air used for the brakes plays an important part. By a suitable regulating valve, air at the high pressure necessary for working brakes is reduced to a constant low pressure and then passes through a small iron box filled with sponge, which is saturated with hydro-carbon (gasoline). The air issues from the box, charged with hydro-carbon, and passes thence to the burners, where a beautiful white light is produced. The cost of the light is much less than that of the present crude system, while the light is sufficient to enable travelers to read fine print in any part of the compartment. In addition to the brake and light, we have also perfected through the same medium a simple and cheap communication for passengers."

Improvements in Traveling.

It is only by means of comparison that one can definitely realize the great improvements in the method of traveling that have taken place within the present century. The changes occur so gradually that they make but little impression upon us. For example, now that the railroad time needed to make the trip between this city (New York) and Philadelphia has been reduced to less than 100 minutes, there are already those who are predicting that in no more time than five years trains will cover the distance between these two cities in a single hour, and no one is the least surprised at the assertion. [Except railroad men.—*Editor RAILROAD GAZETTE*.] In 1800 those who traveled in this country did so at no little personal discomfiture, and with an expenditure of time that would greatly interfere with business as it is now carried on. A man wishing to go from this place to Boston left Monday forenoon and arrived at his destination on Friday afternoon, stopping all night at New Haven, New London, and Providence. The fare for the trip varied from \$15 to \$18, and there was an additional outlay required of from \$5 to \$8 for board and lodging; that is, the trip took up four days of time and called for an outlay of from \$20 to \$24. After the war of 1812 there was an improvement, and the time between this city and Boston was cut down to about two days, and the cost of the journey to \$14. In 1817 the fare between New York and Philadelphia was \$10, and between New York and Albany by boat \$7, and the average time 24 hours. A route was that year opened between Philadelphia and Quebec; the distance 700 miles, fare \$47, and time required to make the journey 103 hours. In 1826 the Boston newspapers recorded the circumstance, as one worthy of special comment, that New York papers had been received in that city in 24 hours after the date of their publication. In 1828 the time required to make the journey between these two cities had been reduced to 21 hours, the route being from this city to Providence by steamboat, and from thence to Boston by stage. But in winter these trips were frequently given up in consequence of stormy weather, and those who wished to avoid danger and be certain in their movements still preferred the overland route. In 1832 there were two regular stage lines between this place and Boston, but competition had greatly reduced the fare. The slow line made the distance in about 52 hours, and charged for passage \$7.50, while the fast, or mail, line took its passengers through in about 45 hours, and charged them \$8.50 a trip. A short time after this the railroads came sufficiently into operation to make it unnecessary to run through trips in stages, and the latter were chiefly used to connect the termini of the slowly building railroads. Having made the progress that we have there is not the least likelihood that the work of improvement will not go on. The history of railroad accidents shows that, while trains on some roads run at a slow rate of speed may meet with mishaps, there is relatively little danger in running at the highest possible speed on a road that is thoroughly constructed, where the appointments are as nearly perfect as possible and the supervision constant. On this account one does not have to be unduly sanguine to think that long before the century is out we shall be able to go from Jersey City to Philadelphia in an hour's time, and from the Grand Central Depot to Boston in a less number of hours than the number of days spent by our ancestors in the year 1800, in making the same trip.—*New York Times*.

A Logging Railroad in Michigan.

The Roscommon (Mich.) Pioneer thus speaks of the Nester Logging Railroad in Roscommon County:

"Among the many improvements that have been made, the most important is the extension of the railroad, which has been increased and extended until 19 miles have been built, and over which a train of 15 cars pass every hour, day and night. The entire railroad affairs are under the charge of the Superintendent, Mr. James Kelley, who has proved himself well worthy the responsible position he occupies. His is an arduous position, and so faithful has he been to his trust that for the past six months he has scarcely known what a night's rest means. There are several bridges on this road that vary from 700 to 1,500 ft. in length. The greatest novelty on the road is the 'Hoister' bridge, at Wood's Lake. This bridge is 1,000 ft. in length and 46 ft. high. About 200 hundred ft. from the end of this bridge is attached the hoisting apparatus by means of which logs are taken from the lake and hoisted upon the bridge by steam power, at the rate of 10 logs per minute, two endless chains running over pulleys being attached on a slide. On this chain apart is fastened the hoisting arrangement, which consists of an iron jaw. One man on the lake rolls the logs up against the slide, and as the chain brings the hoister around two or more logs are taken up the slide, and as they drop on the skids they are scaled and two can-hoist men roll them on the skids to the cars. It takes about an hour to load the train and an hour to make the trip to the landing and return. We visited the landing to see the trains unloaded, and found it an interesting sight. A train of 16 cars was unloaded in just 7 minutes from the time the train stopped, and the logs were afloat in the stream."

"We next visited Rollway Jack's headquarters at Pine Lake, and found here a crew of men under charge of Patsy Radigan grading and laying ties for another branch of railroad that is to be completed this fall. In Pine Lake are 15,000,000 ft. of logs waiting for the locomotive to whirl them down to the Sugar, to be taken by the rivermen and run to the boom limits of the Tittabawasee, on to the mills of Saginaw, and thence to market. Here we found Rollway Jack with his crew rushing the logs in the lake by means of a pole road. Everywhere we found work going on briskly, and, if money is to be made in railroad lumbering, Thomas Nester certainly knows how to get it out."

No Time Lost.

The San Francisco *Evening Post* of Aug. 3 says: "Rapid traveling was perhaps never more fully exemplified than in the case of Patrick Sterling McLean, a prominent barrister of Glasgow, Scotland, who arrived by the overland train yesterday. He left Liverpool on the *Arizona* at 2 p. m. on

July 17; left Queenstown at 9 a. m. July 18; arrived in New York at 9 p. m. on July 25; landed at 8 a. m. on the 26th, and at 8:30 a. m. on the same day left for this city. He reached San Francisco at 11:35 a. m. yesterday (Aug. 2), and at 12 noon sailed for New Zealand on the Pacific Mail steamship "Australia."

Commercial Travelers' Cars.

The scheme to fit up railroad cars for the special use of commercial travelers will soon assume practical shape in the organization of Jacques' Commercial Travelers' Car Co., in which F. H. Farnsworth, H. S. Robinson, John B. Price and Mrs. Catherine L. Morrow of this city will be largely interested. The proposition is to issue 60,000 shares of stock, having a par value of \$25, but for the purpose of making a beginning a portion of the stock will be offered at \$5 a share. Mr. F. H. Farnsworth, of Farnsworth's shoe house, who feels great confidence in the success of the enterprise, has opened subscription books in this city and Boston, and has received strong encouragement from wholesale dealers in the latter city.

The car patented by Geo. S. Jacques combines a sleeper and hotel car with sample room advantages. A car will afford ample accommodation for six commercial travelers with their sample trunks and ordinary baggage and will contain several spacious compartments for the display of their goods. The idea is to attach the car to regular trains and side-track it at such towns as the drummer may desire to do business in. An old railroad manager—one of the most experienced in the country—predicts that the thing is sure to be a success. He thinks the railroads will be glad to co-operate in this new mode of transportation, and will fix regular tariff per mile, limiting each car to a certain number of bona fide commercial travelers. The latter will save a great deal in the way of charges for extra baggage and in the bother and cost of transferring their heavy sample trunks from depots to hotels. Under the new arrangement the traveler will simply invite merchants to inspect his goods on the car instead of in a hotel sample room.

As soon as enough stock is taken to warrant commencing operations, a car will be built in this city and will be put on the road. It is predicted that the new system will, before long, prove an extensive and important one.—*Detroit Post and Tribune*.

A Railroad Hospital.

The Missouri Pacific hospital at Washington ended its first year on July 31 last. Thanks to the courtesy of Superintendent M. P. Wesson, we are able to present a few of the statistics of the institution. During the year 900 employés of the road received the benefit of the institution. Of this number 276 were received and treated at the institution, and the remainder, 630, were treated outside. During the time 3,716 prescriptions have been issued to employés of the road.

Five citizens who were injured on the railroad have been treated at the hospital, but their expenses were paid by the railroad company, and not out of the hospital fund.

The hospital was established for the treatment of sick and wounded employés of the railroad, and is supported by an assessment of 50 cents per month on all employés of the road who are employed for 15 days during the month, and who received more than \$15 in wages.

When the hospital was first established there was considerable opposition manifested by some railroad men, but as an evidence that this spirit is dying out, we see men now entering the hospital for treatment who one year ago swore they would never set a foot in the institution.

The management, under Mr. M. B. Wesson, Superintendent; Dr. J. W. Jackson, Chief Surgeon, and Dr. W. S. Allen, Assistant Surgeon, has been singularly successful. Only three deaths have occurred at the institution during the year, and one of these was a citizen who was brought there barely alive.—*Washington (Mo.) Observer*.

Didn't Want to go to Boston.

On the New England railroads every other station is a junction, and all roads lead to Boston. This to a New Yorker is exasperating. We cannot understand why there should be so many facilities of this kind. "I do not want to go there," yelled an irate passenger to a suave brakeman on the Troy & Boston road on the day I came through. The train men were evidently in the pay of the Boston hotels. At every junction we had been invited to "change cars for Boston." The very mile-stones ruled off the miles to Boston. As we dozed along the newsboys brought us Boston books and newspapers. Some of the passengers produced for luncheon Boston brown bread and baked beans. Every indication pointed to Boston as our inevitable destination. So when the passenger answered the brakeman in this rough manner, every one in the car looked grieved. The prim maidens stopped munching their luncheon to eye him with suspicion. A man who did not want to go to a place like Boston must be guarded against.

"You've got to go," said the conductor, firmly, coming forward, "if you stay with us. This train goes to Boston."

"Then I'll get off at the next station," replied the passenger, gathering up his baggage.

"It won't do you no good," asserted the conductor, "for it's a junction and it'll take you to Boston in the long run by another way."

"Well," said the passenger who was evidently from the lake regions of the Empire State, "I'd better have footed it from Cayuga."

Here I interposed while the brakeman and conductor retired to the baggage car to concert fresh schemes against their victim. I was going into Vermont. I informed him that he might stick close to me. He did, and we slipped quietly and safely off at another junction called Eagle Bridge, a "lucus a non lucendo," for there was neither bridge nor eagle in sight.—*New York Evening Post*.

Color-Blindness.

The Republican party in Connecticut has the following "planks" in the platform on which it nominated state officers recently:

Resolved, That the State Board of Health are respectfully requested to make such immediate modification of their rules and regulations under the Act of March, 1880, concerning color-blindness in railroad employés, as will permit all such employés as are now able to distinguish the colors and signals used by railroad companies in this state at practical distances to continue in their several places of duty until after the session of the next General Assembly.

Resolved, That if any legislation is necessary on the subject of color-blindness, we demand that the next Legislature make such alterations in chapter 95 of the public acts of 1880 as will require only the examination of railroad employés by practical tests in the hands of practical men.

Fast Time in England.

An Englishman sends the following letter to the London *Times*: "The train which brought down the Lord Mayor and his suite to Scarborough on Saturday made such a remarkable run that you may think a few details concerning it worthy of record. It consisted of six Great Northern carriages, and the engine was one of the new series, with 8-ft. driving wheels. Leaving King's-Cross at 1:59, we

passed Hatfield platform at 2:23, and Tempsford at 2:52½; these stations are exactly 30 miles apart. At 2:59, exactly one hour from starting, we passed the mile-stone 53½. Abbott's-Ripton, and Holme, stations just six miles apart, were run through at 3:10½ and 3:15½, respectively. Slowing down to 10 miles an hour, we passed Peterborough at 3:23½, or 60½ minutes after Hatfield, the distance being 58½ miles. We reached Stoke Box, 100 miles from London, at 3:52½, having come up the incline of 23½ miles from Peterborough in 28½ minutes—a speed of 50 miles an hour. The train stopped at Grantham at 3:59½, having run the 105 miles from London at an average of 53½ miles per hour. Leaving Grantham at 4:10, Newark, 14½ miles further on, was passed at 4:26; Retford, 33 miles at 4:43½; Doncaster, 50½ miles, at 5:02; Selby, 69 miles, at 5:21½; and York, 82½ miles, was entered at 5:36½, 3 hours and 37½ minutes after the departure from London. The speed from Grantham to Newark averaged 59 miles an hour, from Grantham to Retford 58½ miles, from Grantham to Doncaster 58½ miles, from Grantham to Selby 58, and from Grantham to York 57 miles an hour. Such an average speed as this last, over 82½ successive miles, with three slowings down, at Retford, Doncaster and Selby, has probably never been seen before. The 59 miles from Claypole (near Newark) to Selby were run in 60½ minutes. The 'Scotchman,' of the Great Northern Railway, runs to York in 3 hours 55 minutes, with 7 minutes to stop at Grantham. The Lord Mayor's train ran to York in 3 hours 37½ minutes, and stopped 10½ minutes at Grantham. Including stoppages, it got over the ground to York at an average speed of 52 miles an hour."

OLD AND NEW ROADS.

Baltimore & Delta.—This road is now under construction from Baltimore to Delta, Pa., 42 miles, and it is expected that a considerable part of it will be finished this year. There is said to be a project for making it part of a new line from Baltimore to Philadelphia by extending it from Delta to the Susquehanna, four miles, and then across the Susquehanna to West Chester, 36 miles further. At or near West Chester connection could be made with the projected Philadelphia & Chester County road, on which some work is now being done. This would make a line 108 miles long, or 10 miles more than the Philadelphia, Wilmington & Baltimore.

Bradford, Bordell & Kinzua.—Work has been begun on the extension of this road from its present terminus at Bordell, Pa., to Smethport.

Buffalo & Southwestern.—The following circular to employees was issued by President Moulton on August 23: "The New York, Lake Erie & Western Railroad having leased the Buffalo & Southwestern, in future all accounts are to be reported to the New York, Lake Erie & Western road, and all agents and employés will report to the proper officers of the New York, Lake Erie & Western Railroad.

The following circular to connecting lines was issued on the same date: "The Buffalo & Southwestern Railroad Company have by lease passed their property over to the New York, Lake Erie & Western Railroad Company, dating from Aug. 1, 1880.

"All settlements for business on and after Aug. 1, 1880, will be made direct with the New York, Lake Erie & Western Railroad Company, but all settlements for balances accruing prior to that date will be made with this company as heretofore."

It is stated that the lessee will at once lay steel rails between Hamburg and Jamestown and will make other improvements.

Burlington, Cedar Rapids & Northern.—This company's July statement of earnings contains the following paragraph: "In reply to inquiries we beg to state that all surplus earnings are devoted to the improvement of the property, viz., re-laying main line with steel rails, putting in new bridges, additions to rolling stock, etc., a full statement of which will be found in the company's annual report in January next. We may also state that the proposed lease of the property was not ratified by a majority of the stockholders."

Canadian Pacific.—Tenders will be received until Sept. 8 by F. Braun, Secretary of the Department of Railways and Canals, at Ottawa, Canada, for six scow-plows, six wing-plows and six flangers for use on the Canadian Pacific road in Manitoba during the coming winter. Drawings, specifications and blank forms can be obtained at the office of the Engineer in Chief in Ottawa, or at the Intercolonial Railway offices in St. John, N. B., or Halifax, N. S.

The negotiations for the completion of the Canadian Pacific line by English capitalists are reported as nearly closed.

Chicago & Alton.—Work is in progress on the lowering of the grades at Lexington and Normal, Ill. This is in pursuance of the company's intention to cut down all the grades on the main line to a maximum of 30 feet to the mile. A new iron bridge, 525 feet long, is to replace the old wooden one over the Sangamon, at Springfield.

Chicago, Burlington & Quincy.—A survey is being made for a branch from Shaw Station, Ill., on the Rock Falls Branch, northward to the quarries at Lee Centre. The distance is about four miles.

Chicago, Milwaukee & St. Paul.—The great iron bridge over the Mississippi on the new short line between St. Paul, Minn., and Minneapolis has been completed. Construction trains now run over it, and regular trains will be put on the line in a very short time. The track was laid on this line last year, with the exception of the short distance across the bridge.

The shops at Savanna, Ill., caught fire on the night of Aug. 15, and were burned down, causing a loss of \$20,000. The depot was saved with much difficulty.

Chicago & Northwestern.—The point where the Toledo & Northwestern Branch will cross the Des Moines & Minneapolis line, two miles north of Callanan, Ia., has been named Jewell Junction. Work has been begun on the line which is to diverge at that point and run northwest to Webster City, 18 miles away. The company has announced that it will not claim the subsidies voted along the line in aid of this branch.

Grading has been begun on the branch which is to run from Carroll, Ia., southwest to a point near Harlan.

On the Chicago & Dakota line construction trains are now running to a point 62 miles west from the late terminus at Huron, Dak., and 202 miles from the junction with the Winona & St. Peter at Tracy, Minn. The grading is done for 48 miles further, to Ft. Pierre on the Missouri. Permission has been secured to cross the Sioux reservation west of the Missouri, and the engineers have begun to run the line from Ft. Pierre toward the Black Hills.

Chicago, St. Paul, Minneapolis & Omaha.—Track-laying was begun this week on the connecting line which is to join this company's lines in Nebraska, and complete the line from St. Paul by Sioux City to Omaha.

Delaware, Lackawanna & Western.—This company, according to a current New York report, has decided to build a new line from Binghamton, N. Y., to Buffalo, and to enter into competition for Western business. The new line, it is said, will be built by a new company, which will be organized and controlled in the Delaware, Lackawanna & Western interest. It is even announced that surveys have already been begun.

The current reports make the somewhat extravagant statement that the proposed line will be from 30 to 40 miles shorter than the Erie from New York to Buffalo. Now the Erie line from Jersey City to Binghamton is 214 miles, and the Delaware, Lackawanna and Western is 210 miles, so that the advantage in distance, except four miles, must be made beyond Binghamton. From that point to Buffalo by the Erie it is 208 miles, and a gain of 40 miles could only be made by building in an air line, which is certainly not practicable in a hilly country like Southern New York. That the road will be built is not at all certain as yet, and the parties interested decline making any definite statement about it.

Danville & New River.—At a recent meeting of this company in Danville, Va., it was stated that a section of the road would be completed in a short time and that the line from Danville to Martinsville would be in operation in one year from the present time.

Danville, Olney & Ohio River.—Work is now in progress laying the iron from the Embarrass River, southward to West Liberty, Ill., 14 miles. Trains will probably run to the new terminus next month.

Des Moines & Ft. Dodge.—It is stated that this company will probably build a branch line from Gowrie, Ill., to Sac City.

Negotiations are in progress with the Minneapolis & St. Louis Company about connections to be made at Ft. Dodge, and the running of trains between that place and Des Moines for the new road.

Eastern Extension.—Track is now laid and construction trains running to Tracadie, N. S., 20 miles eastward from the late terminus at Antigonish and 62 miles from the junction with the Intercolonial at New Glasgow. The grading is nearly all done to the Straits of Canso, some 10 miles further.

Fernandina & Jacksonville.—This road has now been located from Hart's Road, Fla., on the Atlantic, Gulf & West India Transit road, to the St. Johns River at Jacksonville. The distance is 21½ miles. Hart's Road is 11½ miles from Fernandina, and it is intended to use the track of the Transit road for that distance.

Fitchburg.—This company offers for sale six Hinckley engines, built at various dates from 1856 to 1870, and now all in good running order. They can be seen at the Charles-ton shop. The sizes of the engines are: 14 by 18 in. cylinder, inside-connected, 5-ft. drivers; 14 by 20 in. cylinder, inside-connected, 5-ft. drivers; 15 by 18 in. cylinder, inside-connected, 5-ft. drivers; 15 by 20 in. cylinder, 4½-ft. drivers; 15 by 20 in. cylinder, inside-connected, 5-ft. drivers, and 16 by 20 in. cylinder, 5-ft. drivers. They have been replaced by heavier engines.

Flint & Pere Marquette.—The Saginaw (Mich.) *Courier* says of the sale of this road, on Aug. 18, which was briefly noted last week: "The decree excepted from said sale, the lands included in the land grant made by the United States and the state of Michigan, to aid in the construction of the said Flint & Pere Marquette Railway, and also excepting from said sale, moneys due or to grow due or heretofore collected from sale of lands or timber from the lands embraced in said land grant. But the sale included the right to call the land grant trustees to account for the moneys received, or that may be received from the proceeds of such lands; and in case there shall be any surplus after the satisfaction of the trusts for which such lands are held, then such surplus is to go to the purchaser."

"At the hour of 12 o'clock noon the Master offered the property for sale, and stated the conditions of sale.

"There was but one bid made, which was the sum of \$1,000,000, and this was made for the committee of bondholders named below. The Master waited half an hour for other bids, but none being made, he made the sale, and gave notice that \$50,000 must be paid at once, and that sale would be held open till half past two for that purpose. The money required having, in the meantime, been paid, at the last named hour the sale was declared closed. The Purchasing Committee take the property in trust, pursuant to a plan arranged, for bondholders who have deposited bonds with them for that purpose.

"The sale was made subject to prior securities, amounting in the aggregate, including all interest computed to May 1, 1880, with interest on coupons in arrear, to the sum of \$4,025,634.45, which amount of prior securities, however, is liable to be reduced by land assets when the same shall have been realized and applied by the trustees of the prior trusts. The land assets referred to consist of about 160,000 acres of land unsold, which it is estimated will produce at least the sum of \$1,000,000. For lands already sold there is due to the trustees about another million, and the trustees have in hand to use for retiring bonds something over \$200,000. So that the prior debts mentioned above will be reduced by the application of these land assets to about \$2,000,000—probably a trifle less. The purchasers also take the property charged with the indebtedness outstanding against the Receiver, which amounts at this date approximately to the sum of \$500,000.

"The sale was made at the instance of the holders of the consolidated bonds, who by this process and by reorganization will convert their bonds into preferred stock. The plan of reorganization contemplates the issue of preferred stock to the amount of \$6,500,000, and the plan also recognizes common stock to the amount of \$3,500,000, which will not be issued, however, until the preferred stockholders shall have received from the net earnings of the road five consecutive annual dividends of 7 per cent. or semi-annual dividends equivalent thereto. When that contingency shall arise, then this common stock is to be issued and delivered to the holders of receipts for common stock given by the bondholders' committee. To pay this dividend of 7 per cent. to the preferred stockholders will require a net income of \$445,000, after providing for the interest on prior securities. The earnings of the road in the hands of the Receiver for the first seven months of 1880 amount to \$856,604.95. If the earnings continue for the remainder of the year at the same ratio, the gross earnings for the year 1880 will be the sum of \$1,468,465.60, and allowing 60 per cent. for operating expenses, the net income will be \$587,388.24.

"It is considered probable, however, that earnings may fall off somewhat towards the close of the year.

"The purchasing committee consists of H. A. V. Post of the firm of Clark, Post & Martin, 34 Pine street, New York, Chairman; L. Snow, Jr., and Francis Hathaway of New Bedford, Mass.; H. H. Fish and Dr. A. G. Brower of Utica, N. Y. The total amount of consolidated bonds outstanding, with interest computed to May 1, 1880, together with interest on coupons in arrear to the same date, is the

